Bid Documents

St. Clair Catholic District School Board

Our Lady of Fatima Catholic School
545 Baldoon Rd
Chatham, Ontario

New Exterior Wall Assembly, Universal Washroom and In-coming Water Service

Project No. 619-CP1835

Prepared by:

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London, Ontario
N6B 1X3

May 18th, 2018

Division 8 – Doors and Windows

Division 9 – Finishing

Division 10 – Specialties

Drawing List

Architectural

A000 – Cover Page, Consultants, Drawing List, Key Plan, Partition Types
A010 – Life Safety Plan
A050 – General Notes
AD100 – Demolition Floor Plan
AD200 – Demolition Ceiling Plan
AD400 – Demolition Sections
A100 – Construction Floor Plans
A150 – Enlarged Floor Plans
A200 – Reflected Ceiling Plan
A300 – Exterior Elevations
A301 – Exterior Elevations
A500 – Wall Sections
A501 – Wall Sections
A502 – Wall Sections
A600 – Plan Details
A625 – Window details
A650 – Section Details
A675 – Section Details
A800 – Finishing Plans
A850 – Interior Elevations
A1000 – Schedules

Civil

SE1 – Site Servicing and Grading Plan
SE2 – Notes and Details

Mechanical

Electrical

Structural

S101 – Structural

End of Section

Submitted By: _____

To: **St. Clair Catholic District School Board**

Project: No. 619-CP1835

New Exterior Wall Assembly, Universal Washroom and In-coming Water Service

Our Lady of Fatima Catholic School
545 Baldoon Rd
Chatham, Ontario

1) BID PRICE

The Drawings, Specifications and other Contract Documents for this Project have been examined, as well as the premises and job site conditions affecting the work. The undersigned hereby offers to complete the work in accordance with the Contract Documents for the following bid price, except as defined below for HST:

_____

_____ Dollars ($_____)

in Canadian funds EXCLUDING HST. HST will be added to the bid price.

In submitting this Bid, the undersigned recognizes and accepts the right of the Owner to accept any Bid, which is deemed the most advantageous to the Owner, (or any part thereof), at the price submitted, or to reject any or all Bids. Acceptance of the Bid and/or award of the contract is subject to the approval of the **St. Clair Catholic District School Board**.

In the event that a discrepancy arises between the written bid price and the associated numerical price, the written bid price will be deemed to be correct.

Harmonized Sales Tax (HST)

The bidder shall not include the applicable HST in the bid price. The successful contractor will indicate on each application for payment as a separate amount the appropriate HST the Owner is obliged to pay.

2) CASH ALLOWANCES

1. Include a Stipulated Sum of Five Thousand Dollar ($5,000.00) to cover costs associated with the supply and installation of new hardware.

2. Include a Stipulated Sum of Three Thousand Dollar ($3,000.00) to cover costs associated with removal of unforeseen Asbestos products discovered during construction.

3. Include a Stipulated Sum of Three Dollar ($3,000.00) to cover costs associated with reinstallation of Fibre Optic communications cable (Cogeco).

Time and Materials rates to be applied against Cash Allowance work. Final reconciliation will adjust the cash allowance as credit the SCCDSB for unexpended amounts and extra to the contractor for over expenditure. The contractor shall refer to the documents for the reconciliation terms and conditions.

3) PRE-ORDERED MATERIAL SUPPLY

Due to severe time constraints, the St. Clair Catholic District School Board has pre-ordered certain items that require a long lead time for delivery. The contractor agrees to assume the materials ordered for inclusion into the work and pay for the items based upon Board purchase order and invoice. The contractor shall mark-up subtrade time and materials billing for this portion of work at 10% only.

The following items have been pre-ordered:

1. **Not Applicable**

4) INSURANCE

The undersigned carries Policy #_____with _____ in the following amounts:

1. Comprehensive General Insurance . . . $_____

2. Automobile Liability Insurance . . . $_____

Provide a signed standard form provided by the Contractor's insurance company or broker stated its intention to provide insurance to the Bidder in accordance with the insurance requirements of the Contract Documents.

5) BONDING

The undersigned has provided with this bid the required Bonding and Surety as outlined in the Instruction to Bidders, Paragraph 1.08.

6) WORKPLACE SAFETY AND INSURANCE BOARD

The Bid package is to include a current Certificate of Good Standing from the Workplace Safety and Insurance Board (WSIB).

7) TIME OF COMPLETION

The undersigned hereby affirms and states that, if awarded the Contract for said work, the entire contract will be completed within the time frames as stated in the Instructions to Bidders, Paragraph 1.11.

8) SUMMARY

The undersigned agrees that the bid price shall remain in effect for a period of 60 (sixty) calendar days from the date of receipt of bids. The undersigned agrees to assume all increases in labour rates and material prices, taxes, duties, cost indexes, or any other rates that may develop during the life of this Contract.

9) DOCUMENTS AND INFORMATION

This Bid is based on the following:

1. Bid Form
2. Instructions to Bidders
3. General Conditions
4. Drawings/Sketches
5. Specifications

10) SCOPE OF WORK

As described in the Drawings and Specifications, the work includes demolition of exterior masonry face brick, ceilings, window assemblies, concrete floors for underfloor services, finishes and site works demolition. New work includes new exterior wall facing assemblies, new window systems, and parapet renovations. New Universal Washroom area and corridor improvements to be completed. Lay in Acoustic (LAT) and some ceilings will be replaced with new ceiling systems in new areas. In certain areas where above ceiling work is required for water service work, ceilings will be replace with new suspended track and finished with previously removed and stored existing ceiling tile as noted on drawings. Site work to provide new underground water service to a newly created water service room are also part of the general scope of work for this project.

11) ADDENDA

The undersigned acknowledges receipt of Addenda Numbers _____ through _____ inclusive, and that the price, or adjustment thereof, for all work required therein is included in this proposal.

12) SEPARATE PRICES

Not Applicable

13) UNIT PRICES

Not Applicable

14) ALTERNATE PRICES

NONE AT THIS TIME

15) LIST OF SUBCONTRACTORS

The following is the list of subcontractors to which reference is made on the submitted Bid Form.

No changes to the List of Subcontractors will be allowed without the Consultant's express written permission.

List each subcontractor by his firm's proper legal designation and indicate whether his business is carried on as an individual, partnership, or limited company.

The bidder submits that in proposing the listed subcontractors, he has consulted each and has ascertained to his complete satisfaction that those named are fully acquainted with the extent and nature of the work involved and of the proposed construction schedule, and that they will execute their work to conform to the requirements of the Contract Documents.

List of Subcontractors:

Demolition _____

Masonry _____

Glazing _____

Metal Siding _____

Mechanical _____

Electrical _____

Spray insulation/membrane _____

16) EXECUTION OF CONTRACT

The Contract form will be a standard Canadian Construction Documents Committee (CCDC) #2 2008 - Stipulated Sum Contract.

SIGNATURE: _____

NAME PRINTED: _____

TITLE: _____

COMPANY: _____

ADDRESS: _____

_____

PHONE: _____

FAX: _____

DATE: _____

END OF BID FORM

INDEX

1.01 INVITATION

.1 **St. Clair Catholic District School Board** (the Owner) invites Bids from General Contractors for **New Exterior Wall Assembly, Universal Washroom and In-coming Water Service at Our Lady of Fatima Catholic School, 545 Baldoon Rd. Chatham, Ontario** as described in this Specification and on Drawings.

1.02 FORM OF CONTRACT

.1 The following documents (all inclusive) shall form a binding Contract between the Owner and the Contractor:
CCDC #2 – 2008 Stipulated Sum Contract

1. Completed Bid Form
2. Specifications and Drawings
3. Signed Letter of Intent
4. Required Bonding
5. WSIB Clearance Certificate

.2 No payments may be made without a fully executed CCDC #2 – 2008 Stipulated Sum Contract.

1.03 BID DOCUMENTS

.1 Each bidder shall receive access to the Bid Documents at:

1. The Windsor & Sarnia Construction Association, The Lambton Area Builders Exchange and London & District Construction Association sites in order to access and download Bid Documents.

    1. Bid Form
    2. Instructions to Bidders
    3. General Conditions
    4. Supplementary Conditions
    5. Drawings/Sketches
    6. Specifications.

.2 Bids shall be submitted on the form provided. All blank spaces in the form must be completed in full. In addition to the signature, the name and position of the individual signing the Bid shall be printed. Bid proposals not submitted in this manner may be rejected.

.3 The Bid proposal shall be delivered to:

St Clair Catholic District School Board
Catholic Education Center,
420 Creek Street
Wallaceburg, ON.
N8A 4C4

.4 Bids shall be received no later than **2:00 p.m. on Monday, June 11th. 2018** local time as indicated on the timeclock of the SCCDSB Reception.

1.04 BID INELIGIBILITY

.1 Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind may, at the discretion of the Owner, be declared informal.
.2 Bids with Bid Forms and enclosures which are improperly prepared may, at the discretion of the Owner, be declared informal.
.3 Bids that fail to include the security deposit, consent of surety, may, at the discretion of the Owner, be declared informal.
.4 Bids based upon prices seeming to be so unbalanced as to adversely affect the interests of the Owner may, at the discretion of the Owner, be declared informal.
.5 Bids based upon an unreasonable period of time for completion of the Work may, at the discretion of the Owner, be declared informal.

1.05 BID SUBMISSION

.1 Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed. One envelope is required for submission of tenders.
.2 Each set of documents contains 1 bid form and Appendices.
.3 Submit one copy of the Bid Form at the time of bidding in a sealed envelope identified as follows:

BID FOR

New Exterior Wall Assembly, Universal Washroom and In-coming Water Service

Our Lady of Fatima Catholic School
545 Baldoon Rd.
Chatham, Ontario

1.06 ADDENDA

.1 If discrepancies in, or omissions from, the Drawings, Specifications or Documents are observed, or if the Bidder shall be in doubt as to their meaning, the bidder shall immediately notify:

Tony Prizio
Procurement Specialist
420 Creek Street
Wallaceburg, ON.
N8A 4C4
Email: Tony.prizio@st-clair.net
CC Email: victoria.iaccino@st-clair.net

.2 Certification thereof will be made in addendum form and distributed prior to bid due date. The Architect will not be responsible for any oral instructions or interpretations.
.3 All addenda issued during the bidding period are to be included and acknowledged in the proposals, and are to be considered part of the Contract Documents.
.4 Questions shall be received up until 48 hours before close of bid, after which no further communications shall occur between the bidding parties and the architect or representatives of the St. Clair Catholic District School Board.
.5 The architect will issue no addenda after 46 hours before the close of bid.

1.07 EXAMINATION OF SITE AND CONTRACT DOCUMENTS

.1 It shall be understood prior to close of bids, that each bidder has visited the site, and has carefully examined the Drawings, Specifications, and all other Contract Documents and other documents referred to therein, the existing site conditions, and thoroughly understands the conditions under which the work will be performed.

.2 Site Examination

.1 The General Contractor shall visit and examine the site and become familiar with all features, characteristics, conditions and suitability of the work affecting the work of the contract. No allowance will be made by the Owner for any errors, misjudgments and/or difficulties encountered by the General Contractor due to any features of peculiarity of the site or surrounding property which exists at the time of the General Contractor's Tender is submitted.

.2 Examination of the site is mandatory. A site walk review is scheduled for **Tuesday May 29th. 2018 @ 4:00 p.m.**

.3 All interested parties will meet at the main entrance of **Our Lady of Fatima Catholic School, 545 Baldoon Rd. Chatham, Ontario** The site may not be available for viewing at any other time.

.4 All General Contractors are invited. No other site review meeting will occur.

.5 Attendance will be taken and the General Contract Bidders' List prepared from attendees.

.6 Bids will not be accepted from General Contractors who do not attend the Mandatory Site Examination and Bidders Briefing.

.7 Attendance by subtrades and suppliers is recommended, but not mandatory.

1.08 BONDING AND SURETY REQUIREMENTS

.1 **General Requirements:**

.1 Bonding requirements are based on the total bid amount **INCLUSIVE** of **ALL** applicable taxes. Bonding requirements are not required for bids less than $100,000.00.

.2 Bid submissions that do not include the required bonding and surety submissions may be declared informal.

.2 **Performance and Surety Bonds:**

.1 For bid amounts greater than $100,000 and less than $500,000 each bid must be accompanied by agreements to provide performance and labour and materials sureties or security deposits. The agreements must indicate that the Awarded Bidder will provide either:

.1 A security deposit in the form of an irrevocable letter of credit, a certified cheque, or a money order made payable to the Board in the value of 10% of the bid amount, or

.2 A surety in the form of a 50% labour and materials and a 50% performance bond to be issued in favour of the Board at the time of contract execution. Only agreements to bond issued by insurers licensed in Canada will be accepted.

.2 For bid amounts of $500,000 and greater, each bid must be accompanied by agreements to bond for 50% performance and 50% labour and materials bonds. Any expense to be incurred must be included in the bid price. Only agreements to bond issued by insurers licensed in Canada will be accepted.

.3 The Awarded Bidder must present the bonds to Purchasing Department at the Catholic Education Center within seven (7) working days of the Proponent receiving the letter of intent. Failure to provide the proper surety within seven (7) working days will result in the rejection of that bid.

.3 **Bid Bond:**

.1 For bid amounts greater than $100,000 and less than $500,000 a security deposit in the form of an irrevocable letter of credit, a certified cheque, a bid bond or a money order in the amount of 10% of the bid amount shall be made payable to the St. Clair Catholic District School Board and must accompany the bid.

.2 For bid amounts of $500,000 and greater, a security deposit in the form of bid bond in the amount of 10% of the bid price shall be made payable to the St. Clair Catholic District School Board and must accompany the bid. Only bonds issued by insurers licensed in Canada will be accepted.

.3 The security deposit of unsuccessful Proponents will be returned without interest after the contract is awarded.

1.09 ACCEPTANCE OR REJECTION OF THE BID PROPOSAL

.1 In submitting this Bid, the Contractor recognizes and accepts the right of the Owner to accept any Bid which may be deemed to be most advantageous to the Owner (or any part thereof) at the price submitted, or to reject any or all Bids. Separate Prices and Alternate Prices may be considered in making final decisions.

1.10 GENERAL REQUIREMENTS FOR CONTRACTOR AWARDED CONTRACT

.1 Before any work may be started on the Contract, the Contractor will be required to:

.1 Supply satisfactory evidence of all current primary insurance coverage required to be supplied by the Contractor. A minimum of $2,000,000.00 per event is required for Liability and Automobile Policies. The Owner shall be included as co-insured.

.2 Supply a current Workplace Safety & Insurance Board Clearance Certificate.

.3 Provide within five (5) days after award of contract, a detailed work schedule including proposed phasing of work to confirm completion date.

.4 Provide information relating to construction safety measures (company Safety Policy).

1.11 TIMING OF PROJECT

.1 The site is available to commence work on **June 30th. 2018.**

.1 Install construction barriers as indicated on the drawings. Provide continuous and safe work areas defined by barriers throughout the entire schedule of work and only to be removed upon the direction of the Board upon completion of the work.

.2 Exterior fencing and barriers shall be relocated and made safe as work progresses in a phased fashion for the wall assembly renovation work. All exterior work shall be completed as soon as possible, and may continue into the fall. The contractor shall develop a schedule of exterior works which will detail areas of work, expected completion and move to new area of work with completion dates and site area returned to the Board. The overall phasing schedule to be reviewed and approved by the architect and the board prior to commencing all work.

.3 Start work on the interior renovations and addition portions of the project as indicated on the drawings as soon as possible, preferably on Saturday, **June 30th. 2018.** The Contractor shall include all costs for labour and material to ensure that the scope of work for the Interior renovation projects in the Universal washroom and Sprinkler room are complete and facilities that are accessible by students and staff are made safe by **Monday, August 27th. 2018.**

.4 After **Sunday, August 26th. 2018**, the ongoing wall assembly replacement work schedule with works in safe and contained areas of the site The contractor is to obtain substantial completion for the entire scope of work by **Friday September 28th. 2018.**

.2 Contractors shall completely review the site, drawings & specifications, have coordinated with all subtrades and material suppliers to confirm the entire scope of work and schedule for completion. In delivering a bid to the Board, the contractor agrees to the expectations for project completion prior to bid close and warrants that all schedules shall be met in accordance with the contract.

1.12 SAFETY

.1 The Contractor shall carry out this project in strict accordance with Occupational Health and Safety Acts; the regulation for construction projects, Ontario Regulation 213/91 as amended by Ontario Regulation 631/94, and other prescribed regulations as they may pertain to the work.

.2 This Contractor shall also provide full time supervision of on-site activities by all workers to ensure applicable regulations and specification requirements are followed at all times.

.3 This Contractor shall take all necessary precautions to ensure the continuous safety of the contract workers, the Owner, the architect, and general public at large on the Owner's property.

1.13 SITE ACCESS

.1 The Contractor shall make good any damage to roads, curbs, sidewalks, fencing or grass damaged by vehicles or equipment during the course of Construction.

1.14 DESIGNATED SUBSTANCES

.1 The contractor shall conduct work in recognition of the most current regulations related to Designated Substances.

1.15 POST BID REVIEW MEETING

.1 A Post Bid Review Meeting may be convened and chaired by the Architect who will invite the Contractor and his major Subcontractors and/or suppliers to review the Contract Documents, Bid submitted, and Schedule. This meeting will be prior to the Owner issuing a Letter of Intent or instruction to proceed. This meeting does not constitute or infer any contract award to the proposed contractor or any other contractor, or that the project will proceed.

END OF INSTRUCTIONS TO BIDDERS

INDEX

1.0 LEGAL REQUIREMENTS, RULES AND RESTRICTIONS

.1 Definitions

.1 **St. Clair Catholic District School Board** and the **Contractor** will be respectively referred to herein as the **Owner** and the **Contractor**. The term subcontractor, as employed herein, includes only those having a direct contract with the Contractor. It includes one who furnishes material worked to a special design according to drawings or specifications, but does not include one who merely furnishes material not so worked.

.2 These General Conditions are part of the Contract.

.3 The Supplementary General Conditions are part of the Contract.

.2 Laws, Ordinances and Regulations

.1 The Contractor shall, in the performance of the Contract, comply with stipulations and representations required by all applicable Federal, Provincial, and Local Laws, Ordinances and Regulations.

.2 Should the Contractor fail with respect to any of these provisions, he/she shall defend, indemnify and hold harmless the Owner from any liability, damage costs or expenses resulting from such failure.

.3 Permits, Space Fees and Taxes

.1 The architect shall apply for the building permit. The owner shall pay for the building permit. The contractor shall pay for any and all other permits required by authorities having jurisdiction including the Ministry of Labour Notice of Project. The Contractor shall submit applications for permits to the Owner for review before filing. The Contractor shall pay all Federal, Provincial and Local taxes, and duties, of whatever character and description, incident to performance of the Contract.

.4 Municipality Inspections

.1 The Contractor will be required to complete the inspections required for this project by using the Municipality standard forms to facilitate all inspections required by the Municipality as appropriate. It should be extended to include any other inspections from any statutory authorities. The permits and list shall be displayed together on the site and copies provided to the Consultant and Owner. As each inspection is arranged and completed the process is to be recorded appropriately and copies forwarded to both the Consultant and Owner for record.

2.0 MATERIALS AND JOB REQUIREMENTS

.1 Cutting and Patching Building Openings

.1 When it is necessary to cut or drill openings in walls, floors, roofs, etc. Precautions shall be taken to prevent dust and falling debris from affecting adjacent areas. All openings shall be patched by the Contractor to match the original construction using workmen skilled in the required crafts.

.2 Inserts and Attachments to Building Structures or Equipment

.1 Any attachments or inserts in walls, ceilings, or building structural members for the support of equipment, ductwork or piping are to be provided by the Contractor. The Contractor must get permission from the Owner to make attachments to an existing structure. Such attachments must conform to all local laws and requirements.

.2 Any temporary attachments to the building or equipment for installation purposes shall be removed by Contractor upon completion of work. Any damage or defacement caused by such removal shall be repaired or replaced by and at Contractor's expense.

.3 Interference with Owner's Work

.1 It is the intention of the Owner to have board staff working in portions of the premises during the term of this Contract.

.2 The Contractor will be required to cooperate with Owner’s workers outside the designated construction site area.

.4 Patching and Replacing of Damaged Work or Property

.1 All damage to the Owner's property, including that to roadways, sidewalks, floors, fences, doorways, glass damage, etc., that is caused by Contractor's or Subcontractor’s work or workers shall be repaired by and at the expense of Contractor and the actual patching, repairing and replacement or work under the Contract shall be done by the firm which installed the work.

.5 Storage of Materials

.1 The Contractor shall not occupy any space on Owner's premises for storage of materials or handling and storage of materials must be done in such manner that minimum interference occurs in connection with Owner's requirements. Hazardous or dangerous materials may be stored on the premises only if prior approval is obtained from the Owner as to the method of storage and location.

.6 **Moving Materials**

.1 If it becomes necessary at any time during the performance of the work to move Contractor's facilities, materials or equipment which have been placed by the Contractor without the Owner's prior approval, the Contractor shall move them or cause them to be moved when so directed by Owner without additional charge.

.2 No materials and equipment necessary under the Contract and delivered upon the premises shall be removed from the premises without the written consent of the Owner. Refer to General Conditions, Section 3, responsibility for equipment materials, and Owner's property.

.7 **Cleaning of Premises**

.1 Each Contractor, and Subcontractor, and/or supplier shall remove rubbish and debris from the site on a daily basis or as directed by the Owner. On completion of the work, all debris shall be removed; the floor shall be thoroughly cleaned and swept; the site shall be left in a tidy condition.

.2 The Contractor is responsible for compliance with all applicable laws for the removal of waste.

.3 Do not use Owner's equipment or facilities for cleaning or for any other reason.

.8 **Owner Requirements for No Smoking**

.1 No Smoking Requirement:
Be advised that the Owner has a no Smoking Requirement on the Owners' property. Contractors are requested to ensure that employees and those of subcontractors and suppliers are advised of the Requirement.

3.0 CONTRACTOR'S RESPONSIBILITY, INSURANCE, PROTECTION

.1 **Contractor's Responsibility**

.1 Contractor assumes all risks of injury to persons including death and/or damage to property resulting from any action or operation under the Contract and/or in connection with the work, except for such injury to persons including death, and/or damage to property caused due to the negligence of the Owner, and undertakes to defend, indemnify and hold the Owner harmless against all such alleged injury or damage.

.2 The Contractor shall immediately notify the Owner of any workplace injury defined under the Occupational Health and Safety act as a "critical Injury" as the incident has been discovered. All other reportable incident injuries to persons or damage to property must be reported to the Owner within 2 hrs of the discovery of the incident. All reports are to be copied to the owner.

.3 The Contractor and Subcontractors and/or Suppliers will be responsible for loss of equipment or materials supplied by Contractor or Subcontractor or turned over to Contractor by Owner.

.2 **Owner's Insurance Responsibility**

.1 The Owner will maintain insurance for Fire and the Extended Coverage perils of windstorm, hail, smoke, explosion, aircraft, vehicle, riot and riot attending a strike, civil commotion including vandalism, malicious mischief and where applicable, sprinkler leakage damage, upon the entire structure on which work of this contract is done or to be done or upon the equipment and materials installed to one hundred percent of the insurable value thereof and the full value of only that equipment and materials, delivered to the site of the project and which are to be included in and remain a part of the permanent construction whether or not installed.

.2 Coverage shall protect the Owner, Contractor and Subcontractors as their interests may appear. Loss, if any, under such insurance shall be adjusted with and payable to the Owner.

.3 **Contractor's Insurance Responsibility**

.1 It shall be the Contractor's responsibility to effect and maintain adequate Fire and Extended Coverage for perils of windstorm, hail, smoke, explosion, aircraft, vehicle, riot and riot attending a strike, civil commotion and vandalism to cover loss or damage to items of Contractor's equipment including tools, scaffolding, forms and the like, sheds and other temporary structures and their contents, owned or rented by the Contractor or for which the Contractor is liable and which are not to remain as part of the permanent construction.

.4 **Construction Safety Measures**

.1 The Contractor will be responsible to take all necessary steps to protect personnel (workers, visitors, general public, etc.) and property, from any harm during the course of the Contract.

.2 All work procedures and equipment will be in accordance with the Owner and legislated standards.

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

.4 The contractor shall supply competent personnel to implement their safety program and ensure that the Owner's standards, and those of the OHSA, are being complied with.

.5 The contractor will report to the Owner, and jurisdictional authorities, any accident or incident involving contractor, university or public; personnel and/or property, arising from the contractor's execution of the work.

.6 The contractor will include all provisions of this contract in any agreement with subcontractors, and hold all subcontractors equally responsible for safe work performance.

.7 If the contractor is responsible for a delay in the progress of the work due to an infraction of legislated or Owner health and safety requirements, the contractor will, with additional cost to the Owner, work such overtime, acquire and use for the execution as to be necessary, in the opinion of the Owner to avoid delay in the final; completion of the work or any operations thereof.

.5 **Internal Combustion Engines and Toxic Fumes**

.1 Before use of internal combustion engines on site or where any toxic fumes may be produced, the precautions required by law are to be in place for review, and the Owner must be advised.
.2 The duration of the work will be predetermined by the Contractor for everyone's information.

.6 **Insurance (Contractor Coverage)**

.1 The Contractor agrees to provide and maintain with responsible insurance carriers satisfactory to Owner, the following insurance:

Comprehensive Liability Insurance

.1 The Contractor shall protect himself and indemnify and save the Owner harmless from any and all claims which may arise from the Contractor's operations under the Contract where bodily injury, death, or property damage is cause and for this purpose shall, without restricting the generality of the foregoing, maintain insurance acceptance to the Owner, to the limits of not less than:

.1	Injury or death to one person Injury or death to more than one person	) minimum of) $2,000,000.00
.2	Automobile	) $2,000,000.00) inclusive

Issue liability insurance in the joint names of the Owner and the Contractor.

.7 **Workplace Safety Insurance Board (WSIB)**

.1 The Contractor shall include with his bid documents a current WSIB certificate of good standing.
.2 At each progress invoice the contractor is required to provide a current WSIB certificate of good standing.

.8 **Protection of Premises and Persons**

.1 The Contractor shall properly protect Owner's and adjoining property from injury. Any damage to same shall be repaired or replaced by the Contractor without delay.

.2 The Contractor shall provide and properly maintain warning signs, dust proof barriers, welding tarpaulins, barricades and other safeguards for the protection of workmen and others around holes and openings, on, about, or adjacent to the work as required by the conditions and progress of the work or as directed by the Owner.

.3 At the end of each working day, all construction materials should be accumulated and piled in designated areas.

.9 **Non Compliance with Safety Rules and Regulations**

.1 Non-compliance of any of the safety requirements contained in this section may result in the Contractor or Subcontractor being requested to remove the offending person or persons from the Owner's premises.

.10 **Substitution of Subcontractors or Suppliers**

.1 The Contractor must submit in writing at the time of Bid the identified list of Subcontractors and/or Suppliers who will be employed on the Contract. The Contractor must also submit in writing all other sub-contractors and suppliers listed which will be employed on the Contract at the Post Bid Meeting. Substitution of named Subcontractors and Suppliers after submission of Bids will not be accepted unless a valid reason in writing is given to and approved by the Owner. The reason for substitution must be provided to the original listed Subcontractor or Supplier and the Subcontractor or Supplier given an opportunity to reply to the Contractor and Owner. Contractors are expected to be fully aware of the capability (technical, financial, etc.) of their listed Subcontractors and Suppliers and be prepared to work together prior to submission of the Bid. Similarly, the uses of the term ‘own forces’ and the subsequent use of unlisted Subcontractors or Suppliers is not acceptable and could result in rejection of the Bid. All Subcontractor and Supplier listings must be firm prior to the issue of a letter of intent or contract. Failure to meet these requirements will permit the Owner to cancel the contract at any stage.

.11 **Project Site Supervisor** (Site Superintendent)

.1 The designated Site Superintendent (i.e. not a replacement) is to remain full time on the project for a minimum period of 1 week after substantial completion of the project, or until all deficiencies are completed, deemed completion has been achieved and approval of the Owner and Consultant has been obtained.

.2 For the purpose of this Contract, the “Superintendent” shall mean and shall be interchangeable with the term “Supervisor.”

4.0 TEMPORARY FACILITIES (CONTROL OF USE AND RESTRICTIONS)

.1 **Water**

.1 A source of water will be designated by the Owner. Extensions must be approved by the Owner to avoid possible accidental reverse flow.

.2 **Electric Power**

.1 A source of electric power will be designated by the Owner. The Owner will allow a tie-in connection with fuse or breaker protection for the Contractor's estimated load requirements. The Contractor must provide the power connections and all extensions from this point to the job site. All electrical connections and extensions must meet ESA requirements and must be approved by the Owner. The Contractor's estimated load requirements must not be exceeded without the Owner's permission.

.3 **Toilet Facilities**

.1 Contractor's employees shall use only those toilet and washroom facilities designated by the Owner or provide their own facilities.

.2 In the event that the contractor elects to use board facility washrooms, the contractor will be responsible for the maintenance, stocking and cleaning of the designated washroom. The designated washroom shall be returned to the board in the same condition as received by the contractor. Any and all damages to facilities while under the control of the general contractor shall be repaired at the general contractors cost.

.4 **Telephone**

.1 The Contractor will be expected to provide and pay for own telephone service as required for the job.

5.0 ARCHITECTS REVIEW

.1 The architect’s review and those of his sub-consultants is for the purpose of assuring the Owner that the plans and specifications are being properly executed. The Owner will not supervise or give instructions to the Contractor's employees other than the Contractor's Superintendent through the architect. While the architect will give the Contractor all desired assistance in interpreting the drawings, specifications and intent, such assistance shall not relieve the Contractor from any responsibility for the work.

.2 In the event that the architect may have permitted or overlooked faulty work, or work done which is not in accordance with drawings and specifications, shall not prevent the architect from insisting that the Contractor make all work right. Any work, which proves faulty, shall be rectified by the Contractor without delay.

.3 **Contractor to Assist Architect**

.1 The Contractor shall provide sufficient, safe and proper access facilities at all times for the review of the work by the architect.

.4 **Cooperation between Contractor, Subcontractors and Trades**

.1 Anything necessary on the part of any one trade to make possible or expedite the work of other trades shall be done as part of the Contract by the Contractor without additional expenses to the Owner.

6.0 AS BUILT INFORMATION

.1 The General Contractor will provide As Built information in accordance with the architect's instructions.

7.0 PAYMENTS TO CONTRACTOR

.1 **Certificate & Payments (In General)**

.1 The Owner shall pay within forty-five (45) days after the receipt of the invoices which are received and approved by the architect.

.2 A 10% holdback of invoiced amounts, plus a 1 ½% completion retention amount will be withheld in accordance with the current provisions of the Provincial Lien Legislation and General Conditions of the contract.

.3 Upon determination of Substantial completion as certified by the architect and notification of Substantial Completion being duly advertised, the Lien period shall commence. On the 45th day, holdback monies shall be released upon clear search of title by the St. Clair Catholic District School Board.

.4 Once all as-built drawings and maintenance materials are received and vetted by the architect, the 1 ½ % completion retention shall be released for payment.

.2 **Evidence of Payment to Subcontractors**

.1 The monthly billing (progress draw) is to be accompanied by statutory declarations (affidavit) indicating payment of obligations to Subcontractors, for purchase of materials, and own payroll to the date of billing.

.3 **Change Notices, Change Orders**

The following fee percentage and overhead charges shall be applied to additional work ordered by the Owner:

Refer to Supplementary to CCDC2 – 2008 GC 6.2 Change Order.

8.0 GUARANTEE

.1 The guarantee shall be for a period of 1 year from and after completion of the entire job and acceptance thereof by Owner unless a different period of time is specified with the Owner's approval. The Contractor's guarantee shall cover all work under the Contract whether or not any portion or trade has been sublet.

.1 The Contractor agrees to correct promptly, at the Contractor's own expense, defects or deficiencies in the Work which appear prior to and during the period of guarantee, or such longer periods as may be specified for certain products or work.

.2 If the Contractor fails to make any replacements or repairs required hereunder, after notice from Owner and reasonable opportunity to do so, Owner may have such work done at Contractor's expense, including all necessary labour costs in connection therewith. Owner shall inform Contractor in advance of the approximate cost of any such work to be done by Owner.

9.0 MEETINGS

.1 POST BID REVIEW MEETING

1. A Post Bid Review Meeting may be convened and chaired by the architect who will invite Contractor and his major Subcontractors to review the Contract Documents and Bid submitted. This meeting will be prior to the Owner issuing a Letter of Intent or Contract and subject to requisite Owner approvals. This meeting does not constitute or infer any contract award to the proposed contractor or any other contractor, nor that will the project proceed.

.2 PROGRESS MEETINGS

1. During the course of Work, schedule progress meetings as may be required and at the call of the Consultant until Project Completion.

.3 OWNERS'S CONTRACTED SERVICES PROGRAM

1. Contractors, their employees and subtrades must complete the SCCDSB Contracted Services Program and obtain an identification badge which must be worn at all times while working on any SCCDSB project. Obtain the information regarding this program from the St. Clair Catholic District School Board's website at ***www.st-clair.net***.

END OF GENERAL CONDITIONS

ST. CLAIR CATHOLIC
DISTRICT SCHOOL BOARD

CCDC 2- 2008
Stipulated Price Contract

~

Supplementary Conditions

January 7, 2012

The Standard Construction Document CCDC 2 2008 for a Stipulated Price Contract, English version, consisting of the Agreement Between *Owner* and *Contractor*, Definitions and General Conditions of the Stipulated Price Contract, Parts 1 to 12 inclusive, governing same is hereby made part of these *Contract Documents*, with the following amendments, additions and modifications:

AGREEMENT BETWEEN OWNER AND CONTRACTOR

ARTICLE A-3 – CONTRACT DOCUMENTS

3.1 Add the following to the list of *Contract Documents* in paragraph 3.1:

- Amendments to CCDC 2 – 2008
- *Drawings*
- *Specifications*
- Performance Bond
- Labour and Material Payment Bond

ARTICLE A-5 – PAYMENT

5.1.3 Amend paragraph 5.1.3, in the first line, by deleting the words "…the issuance of the…" and replacing them with "…receipt of the *Consultant's*..."

5.3.1 Delete paragraph 5.3.1 in its entirety and replace it with the following:

Interest

.1 Should either party fail to make payments as they become due under the terms of the Contract or in an award by arbitration or court, interest shall also become due and payable on such unpaid amounts at 0% above the prime rate. Such interest shall be compounded on a monthly basis. The prime rate shall be the rate of interested quoted by the Bank of Canada for prime business loans, as it may change from time to time.

ARTICLE A-9 – CONFLICT OF INTEREST

Add new Article A-9 – Conflict of Interest:

9.1 The *Contractor*, all of the *Subcontractors* and *Suppliers* and any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall not engage in any activity or provide any services where such activity or the provision of such services creates a conflict of interest (actually or potentially, in the sole opinion of the *Owner*) with the provision of the *Work* pursuant to the *Contract*. The *Contractor* acknowledges and agrees that a conflict of interest, as described in this Article A-9, includes, but is not limited to, the use of *Confidential Information* where the *Owner* has not specifically authorized such use.

9.2 The *Contractor* shall disclose to the *Owner*, in writing, without delay, any actual or potential situation that may be reasonably interpreted as either a conflict of interest or a potential conflict of interest, including the retention of any *Subcontractor* or *Supplier* that is directly or indirectly affiliated with or related to the *Contractor*.

9.3 The *Contractor* covenants and agrees that it will not hire or retain the services of any employee or previous employee of the *Owner* where to do so constitutes a breach by such employee or previous employee of the *Owner's* conflict of interest policy, as it may be amended from time to time, until after completion of the *Work* under the *Contract*.

9.4 It is of the essence of the *Contract* that the *Owner* shall not have direct or indirect liability to any *Subcontractor* or *Supplier*, and that the *Owner* relies on the maintenance of an arm's-length relationship between the *Contractor* and its *Subcontractors* and *Suppliers*. Consistent with this fundamental term of the *Contract*, the *Contractor* will not enter into any agreement or understanding with any *Subcontractor* or *Supplier*, whether as part of any contract or any written or oral collateral agreement, pursuant to which the parties thereto agree to cooperate in the presentation of a claim for payment against the *Owner*, directly or through the *Contractor*, where such claim is, in whole or in part, in respect of a disputed claim by the *Subcontractor* or *Supplier* against the *Contractor*, where the payment to the *Subcontractor* or *Supplier* by the *Contractor* is agreed to be conditional or contingent on the ability to recover those amounts or a portion thereof from the *Owner*, failing which the *Contractor* shall be saved harmless from all or a portion of those claims. The *Contractor* acknowledges that any such agreement would undermine the required arm's-length relationship and constitute a conflict of

interest. For greater certainty, the *Contractor* shall only be entitled to advance claims against the *Owner* for amounts pertaining to *Subcontractor* or *Supplier* claims where the *Contractor* has actually paid or unconditionally acknowledged liability for those claims or where those claims are the subject of litigation or binding arbitration between the *Subcontractor* or *Supplier* and the *Contractor* has been found liable for those claims.

9.5 Notwithstanding paragraph 7.1.2 of GC 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT, a breach of this Article by the *Contractor*, any of the *Subcontractors*, or any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall entitle the *Owner* to terminate the *Contract*, in addition to any other rights and remedies that the *Owner* has in the *Contract*, in law, or in equity.

DEFINITIONS

Add the following new definitions:

27. **Confidential Information**

Confidential Information means all the information or material of the *Owner* that is of a proprietary or confidential nature, whether it is identified as proprietary or confidential or not, including but not limited to information and material of every kind and description (such as drawings and move-lists) which is communicated to or comes into the possession or control of the *Contractor* at any time, but *Confidential Information* shall not include information that:

1) is or becomes generally available to the public without fault or breach on the part of the *Contractor*, including without limitation breach of any duty of confidentiality owed by the *Contractor* to the *Owner* or to any third party, but only after that information becomes generally available to the public;

2) the *Contractor* can demonstrate to have been rightfully obtained by the *Contractor* from a third party who had the right to transfer or disclose it to the *Contractor* free of any obligation of confidence;

3) the *Contractor* can demonstrate to have been rightfully known to or in the possession of the *Contractor* at the time of disclosure, free of any obligation of confidence; or

4) is independently developed by the *Contractor* without use of any *Confidential Information*.

28. Construction Schedule

Construction Schedule means the schedule for the performance of the *Work* provided by the *Contractor* pursuant to GC 3.5, including any amendments to the *Construction Schedule* made pursuant to the *Contract Documents*.

29. Force Majeure

Force Majeure means any cause, beyond the *Contractor's* control, other than bankruptcy or insolvency, which prevents the performance by the *Contractor* of any of its obligations under the *Contract* and the event of *Force Majeure* was not caused by the *Contractor's* default or active commission or omission and could not be avoided or mitigated by the exercise of reasonable effort or foresight by the *Contractor*. *Force Majeure* includes *Labour Disputes*, fire, unusual delay by common carriers or unavoidable casualties, civil disturbance, acts, orders, legislation, regulations or directives of any government or other public authority, acts of a public enemy, war, riot, sabotage, blockage, embargo, lightning, earthquake, or acts of God.

30. Install

Install means install and connect. *Install* has this meaning whether or not the first letter is capitalized.

31. Labour Dispute

Labour Dispute means any lawful or unlawful labour problems, work stoppage, labour disruption, strike, job action, slow down, lock-outs, picketing, refusal to work or continue to work, refusal to supply materials, cessation or work or other labour controversy which does, or might, affect the *Work*.

32. Overhead

Overhead means all site and head office operations and facilities, all site and head office administration and supervision; all duties and taxes for permits and licenses required by the authorities having jurisdiction at the *Place of the Work*; all requirements of Division 1, including but not limited to submittals, warranty, quality control, insurance and bonding; calculations, testing and inspections; meals and accommodations; and, tools, expendables and clean-up costs.

33. Request for Information/RFI

Request for Information or *RFI* means written documentation sent by the *Contractor* to the *Owner* or to the *Owner's* representative or the *Consultant* requesting written clarification(s) and/or interpretation(s) of the *Drawings* and/or *Specifications*, *Contract* requirements and/or other pertinent information required to complete the *Work* of the *Contract* without applying for a change or changes to the *Work*.

4. Amend Definition 4 by adding the following to the end of the Definition:

For the purposes of the *Contract*, the terms "*Consultant"*, "Architect" and "Engineer" shall be considered synonymous.

16. Amend Definition 16 by adding the following to the end of the Definition:

Provide has this meaning whether or not the first letter is capitalized.

GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

1.0 Where a General Condition or paragraph of the General Conditions of the *Contract* is deleted by these amendments, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, unless stated otherwise herein, and the numbering of the deleted item will be retained, unused.

GC 1.1 CONTRACT DOCUMENTS

1.1.6 Add the following to the end of paragraph 1.1.6:

The *Specifications* are divided into divisions and sections for convenience but shall be read as a whole and neither such division nor anything else contained in the *Contract Documents* will be construed to place responsibility on the *Owner* or the *Consultant* to settle disputes among the *Subcontractors* and *Suppliers* with respect to such divisions. The *Drawings* are, in part, diagrammatic and are intended to convey the scope of the *Work* and indicate general and appropriate locations, arrangements and sizes of fixtures, equipment and outlets. The *Contractor* shall obtain more accurate information about the locations, arrangements and sizes from study and coordination of the *Drawings*, including *Shop Drawings* and shall become familiar with conditions and spaces affecting those matters before proceedings with the *Work*. Where site conditions require reasonable minor changes in indicated locations and arrangements, the *Contractor* shall make such changes at no additional cost to the *Owner*. Similarly, where known conditions or existing conditions interfere with new installation and require relocation, the *Contractor* shall include such relocation in the *Work*. The *Contractor* shall arrange and install fixtures and equipment in such a way as to conserve as much headroom and space as possible. The schedules are those portions of the *Contact Documents*, wherever located and whenever issued, which compile information of similar content and may consist of drawings, tables and/or lists.

1.1.7 Amend paragraph 1.1.7.1 by adding "Amendments to CCDC 2 – 2008" before "the Agreement between the Owner and the Contractor" and deleting the reference to "Supplementary Conditions".

Add new paragraphs 1.1.7.5, 1.1.7.6, 1.1.7.7, 1.1.7.8, 1.1.7.9 and 1.1.7.10 as follows**:**

.5 noted materials and annotations on the *Drawings* shall govern over the graphic representation of the *Drawings.*

.6 finishes in the room finish schedules shall govern over those shown on the *Drawings.*

.7 Schedules of Division 01 – General Requirements of the *Specifications* shall form part of and be read in conjunction with the technical specification section as listed in the table of contents of the *Specifications.*

.8 architectural drawings shall have precedence over structural, plumbing, mechanical, electrical and landscape drawings insofar as outlining, determining and interpreting conflicts over the required design intent of all architectural layouts and architectural elements of construction, it being understood that the integrity and installation of the systems designed by the *Consultant* or its sub-*Consultants* are to remain with each of the applicable drawing disciplines.

.9 fixturing drawings provided by the *Owner* shall have precedence over architectural drawings insofar as outlining, determining and interpreting conflicts over the required design intent of all architectural layouts.

.10 should reference standards contained in the *Specifications* conflict with the *Specifications*, the *Specifications* shall govern. Should reference standards and *Specifications* conflict with each other or if certain requirements of the *Specifications* conflict with other requirements of the *Specifications*, the more stringent requirements shall govern.

1.1.8 Delete paragraph 1.1.8 in its entirety and substitute as follows:

The *Consultant*, on behalf of the *Owner* shall provide the *Contractor* without charge, twelve (12) copies of the *Contract Documents*, exclusive of those required by jurisdictional authorities and the executed *Contract Documents*. Additional copies can be purchased by the *Contractor* at the *Consultant's* cost of reproduction, handling and sales tax.

1.1.11 Add new paragraph 1.1.11 as follows:

The *Contract Documents* shall be signed in triplicate (3) by the *Owner* and the *Contractor*, and each of the *Contractor*, the Owner and the *Consultant* shall retain one set of signed and sealed (if required by the governing law of the *Contract*) *Contract Documents*.

GC 1.3 RIGHTS AND REMEDIES

1.3.2 Delete the word "No" from the beginning of paragraph 1.3.2 and substitute the words:

"Except with respect to the requirements set out in paragraphs 2.2.13, 6.4.1, 6.5.4, 6.6.1 and 8.2.2, no…"

GC 1.4 ASSIGNMENT

Delete paragraph 1.4.1 in its entirety and replace with the following:

1.4.1 The *Contractor* shall not assign the *Contract*, or any portion thereof, without the prior written consent of the *Owner*, which consent may be unreasonably withheld. The *Owner* shall be entitled to assign the *Contract* to a corporation, partnership or other entity (the "Assignee"). Upon the assumption by the Assignee of the *Owner's* obligations under the *Contract*, the *Owner* shall be released from its obligations under the *Contract*.

GC 1.5 EXAMINATION OF DOCUMENTS AND SITE

Add new GC 1.5 – EXAMINATION OF DOCUMENTS AND SITE as follows:

1.5.1 The *Contractor* declares and represents that in tendering for the *Work*, and in entering into a *Contract* with the *Owner* for the performance of the *Work*, it has either investigated for itself the character of the *Work* to be done and all local conditions, including the location of any utility which can be determined from the records or other information available at the offices of any person, partnership, corporation, including a municipal corporation and any board or commission thereof having jurisdiction or control over the utility that might affect its tender or its acceptance of the *Work*, or that, not having so investigated, the *Contractor* has assumed and does hereby assume all risk of conditions now existing or arising in the course of the *Work* which might or could make the *Work*, or any items thereof more expensive in character, or more onerous to fulfil, than was contemplated or known when the tender was made or the *Contract* signed.

1.5.2 The *Contractor* also declares that in tendering for the *Work* and in entering into this *Contract*, the *Contractor* did not and does not rely upon information furnished by the *Owner* or any of its agents or servants respecting the nature or confirmation of the ground at the site of the *Work*, or the location, character, quality or quantity of the materials to be removed or to be employed in the construction of *Work*, or the character of the construction machinery and equipment or facilities needed to perform the *Work*, or the general and local performance of the work under the *Contract* and expressly waives and releases the *Owner* from all claims with respect to the said information with respect to the *Work*.

GC 1.6 TIME IS OF THE ESSENCE OF THE CONTRACT

Add new GC 1.6 - TIME IS OF THE ESSENCE OF THE CONTRACT as follows:

1.6.1 All time limits stated in the *Contract Documents* are of the essence of the *Contract*.

GC 2.2 ROLE OF THE CONSULTANT

2.2.7 Delete the words "Except with respect to GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER" .

2.2.13 Amend paragraph 2.2.13 by the addition of the following to the end of that paragraph:

If, in the opinion of the *Contractor*, the *Supplemental Instruction* involves an adjustment in the *Contract Price* or in the *Contract Time*, it shall, within ten (10) *Working Days* of receipt of a *Supplemental Instruction*, provide the *Consultant* with a notice in writing to that effect. Failure to provide written notification within the time stipulated in this paragraph 2.2.13 shall be deemed an acceptance of the *Supplemental Instruction* by the *Contractor*, without any adjustment in the *Contract Price* or *Contract Time*.

2.2.19 Add new paragraph 2.2.1.9 as follows:

The *Consultant* or the *Owner*, acting reasonably, may from time to time require the *Contractor* to remove from the *Project* any personnel of the *Contractor*, including project managers, superintendents or *Subcontractors*. Such persons shall be replaced by the *Contractor* in a timely fashion to the satisfaction of the *Consultant* or the *Owner*, as the case may be, at no cost to the *Owner*.

GC 2.3 REVIEW AND INSPECTION OF THE WORK

2.3.2 Amend paragraph 2.3.2 by adding the words "and *Owner*" after the words "*Consultant*" in the second and third lines.

2.3.3 Delete paragraph 2.3.3 in its entirety and replace it with the following:

The *Contractor* shall furnish promptly two copies to the *Consultant* and one copy to the *Owner* of all certificates and inspection reports relating to the *Work*.

2.3.4 Insert the word "review" after the word "inspections" in the first line of paragraph 2.3.4.

2.3.5 In the first line after "*Consultant"*, add "or the *Owner"*.

2.3.8 Add a new paragraph 2.3.8 as follows:

The *Consultant* will conduct periodic reviews of the *Work* in progress, to determine general conformance with the requirements of the *Contract Documents*. Such reviews, or lack thereof, shall not give rise to any claims by the *Contractor* in connection with construction means, methods, techniques, sequences and procedures, nor in connection with construction safety at the *Place of Work*, responsibility for which belongs exclusively to the *Contractor*.

GC 2.4 DEFECTIVE WORK

2.4.1 Amend GC 2.4.1 by inserting ", the *Owner* and/or its agent" in the first sentence following "rejected by the *Consultant*".

Add new paragraphs 2.4.1.1 and 2.4.1.2:

2.4.1.1 The *Contractor* shall rectify, in a manner acceptable to the *Owner* and the *Consultant*, all defective work and deficiencies throughout the *Work*, whether or not they are specifically identified by the *Consultant*.

2.4.1.2 The *Contractor* shall prioritize the correction of any defective work, which, in the sole discretion of the *Owner*, adversely affects the day to day operations of the *Owner* or which, in the sole discretion of the *Consultant*, adversely affects the progress of the *Work*.

2.4.2 Delete paragraph 2.4.2 in its entirety and replace it with the following:

The *Contractor* shall promptly pay the *Owner* for costs incurred by the *Owner*, the *Owner's* own forces or the *Owner's* other contractors, for work destroyed or damaged or any alterations necessitated by the *Contractor's* removal, replacement or re-execution of defective work. The *Owner* may request that the *Contractor* rectify any such deficiencies to other contractors' work, at the *Contractor's* expense.

Add new paragraph 2.4.4 as follows:

2.4.4 Neither acceptance of the *Work* by the *Consultant* or the *Owner*, nor any failure by the *Consultant* or the *Owner* to identify, observe or warn of defective *Work* or any deficiency in the *Work* shall relieve the *Contractor* from the sole responsibility for rectifying such defect or deficiency at the *Contractor's* sole cost, even where such failure to identify, observe or warn is negligent.

GC 3.1 CONTROL OF THE WORK

3.1.3 Add a new paragraph 3.1.3 as follows:

Prior to commencing individual procurement, fabrication and construction activities, the *Contractor* shall verify at the *Place of the Work*, all relevant measurements and levels necessary for proper and complete fabrication, assembly and installation of the *Work* and shall further carefully compare such field measurements and conditions with the requirements of the *Contract Documents*. Where dimensions are not included or exact locations are not apparent, the *Contractor* shall immediately notify the *Consultant* in writing and obtain written instructions from the *Consultant* before proceedings with any part of the affected *Work*.

3.1.4 Add a new paragraph 3.1.4 as follows:

Notwithstanding the provisions of paragraphs 3.1.1 and 3.1.2, the *Owner* shall have access to the site at all times to monitor all aspects of construction. Such access shall in no circumstances affect the obligations of the *Contractor* to fulfill its contractual obligations.

GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

3.2.2.1 Delete paragraph 3.2.2.1 in its entirety.

3.2.2.2 Delete paragraph 3.2.2.2 in its entirety.

3.2.2.3 Delete paragraph 3.2.2.3 in its entirety.

3.2.2.4 Delete paragraph 3.2.2.4 in its entirety.

3.2.3.2 Delete paragraph 3.2.3.2 and replace it with the following:

Co-ordinate and schedule the activities and work of other contractors and *Owner's* own forces with the *Work* of the *Contractor* and connect as specified or shown in the *Contract Documents*.

3.2.3.4 Add new paragraph 3.2.3.4 as follows:

Subject to GC 9.4 CONSTRUCTION SAFETY, for the *Owner's* own forces and for other contractors, assume overall responsibility for compliance with all aspects of the applicable health and safety legislation in force at the *Place of the Work*, including all of the responsibilities of the "constructor", pursuant to the *Occupational Health and Safety Act* (Ontario)...

GC 3.3 TEMPORARY WORK

3.3.2 In paragraph 3.3.2, in the second line after the words "where required by law", insert "or the *Consultant*".

GC 3.4 DOCUMENT REVIEW

3.4.1 Delete paragraph 3.4.1 in its entirety and substitute new paragraph 3.4.1:

The *Contractor* shall review the *Contract Documents* and shall report promptly to the *Consultant* any error, inconsistency, or omission the *Contractor* may discover. Such review by the *Contractor* shall be undertaken with the standard of care described in paragraph 3.14.1 of the *Contract*. Except for its obligation to make such review and report the result, the *Contractor* does not assume any responsibility to the *Owner* or to the *Consultant* for the accuracy of the *Contract Documents*. Provided it has exercised the degree of care and skill described in this paragraph 3.4.1, the *Contractor* shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the *Contract Documents*, which the *Contractor* could not reasonably have discovered through the exercise of the required standard of care.

3.4.2 Add new paragraph 3.4.2. as follows:

If, at any time, the *Contractor* finds errors, inconsistencies, or omissions in the *Contract Documents* or has any doubt as to the meaning or intent of any part thereof, including laying out of the Work, the *Contractor* shall immediately notify the *Consultant*, and request instructions, a *Supplemental Instruction*, *Change Order*, or *Change Directive*, as the case may require, and the *Contractor* shall not proceed with the work affected until the *Contractor* has received such instructions, a *Supplemental Instruction*, *Change Order* or *Change Directive*. Neither the *Owner* nor the *Consultant* will be responsible for the consequences of any action of the *Contractor* based on oral instructions.

3.4.3 Add new paragraphs 3.4.3 and 3.4.4 as follows:

Errors, inconsistencies and/or omissions in the *Drawings* and/or *Specifications* which do not allow completion of the *Work* of the *Contract* shall be brought to the *Consultant's* attention prior to the execution of the *Contract* by means of an *RFI*.

3.4.4 Notwithstanding the foregoing, errors, inconsistencies, discrepancies and/or omissions shall not include lack of reference on the *Drawings* or in the *Specifications* to labour and/or *Products* that are required or normally recognized within respective trade practices as being necessary for the complete execution of the *Work*. The *Contactor* shall not use subsequent *RFIs*, issued during execution of the *Work* to establish a change and/or changes in the *Work* pursuant to Part 6 – CHANGES IN THE WORK.

GC 3.5 CONSTRUCTION SCHEDULE

3.5.1 Delete paragraph 3.5.1 in its entirety and replace with the following:

The *Contractor* shall:

.1 within five (5) calendar days of receiving written confirmation of the award of the Contract, prepare and submit to the *Owner* and the *Consultant* for their review and acceptance, a construction schedule in the format indicated below that indicates the timing of the activities of the *Work* and provides sufficient detail of the critical events and their inter-relationship to demonstrate the *Work* will be performed in conformity with the *Contract Time* and in accordance with the *Contract Documents*. Such schedule is to include a delivery schedule for *Products* whose delivery is critical to the schedule for the *Work* or are required by the *Contract* to be included in a *Products* delivery schedule. The *Contractor* shall employ construction scheduling software, being the latest version of "Microsoft Project", that permits the progress of the *Work* to be monitored in relation to the critical path established in the schedule. The *Contractor* shall provide the schedule and any successor or revised schedules in both electronic format and hard copy. Once accepted by the *Owner* and the *Consultant*, the construction schedule submitted by the *Contractor* shall become the baseline construction schedule; and,

.2 provide the expertise and resources, such resources including manpower and equipment, as are necessary to maintain progress under the accepted baseline construction schedule or revised schedule accepted by the *Owner* pursuant to GC 3.5 CONSTRUCTION SCHEDULE; and,

.3 monitor the progress of the *Work* on a weekly basis relative to the baseline construction schedule, or any revised schedule accepted by the *Owner* pursuant to GC 3.5 CONSTRUCTION SCHEDULE, update and submit to the *Consultant* and *Owner* the electronic and hard copy schedule on a monthly basis, at a minimum, or as required by the *Consultant* and advise the *Consultant* and the *Owner* weekly in writing of any variation from the baseline or slippage in the schedule; and,

.4 provide overtime work without change to the *Contract Price* if such work is deemed necessary to meet the schedule; and,

.5 ensure that the *Contract Price* shall include all costs required to phase or stage the *Work*.

3.5.2 Add new paragraph 3.5.2 as follows:

If, at any time, it should appear to the *Owner* or the *Consultant* that the actual progress of the *Work* is behind schedule or is likely to become behind schedule, or if the *Contractor* has given notice of such to the *Owner* or the *Consultant* pursuant to subparagraph 3.5.1.3, the *Contractor* shall, either at the request of the *Owner* or the *Consultant*, or following giving notice pursuant to subparagraph 3.5.1.3, take appropriate steps to cause the actual progress of the *Work* to conform to the schedule or minimize the resulting delay. Within five (5) calendar days of the request by the *Owner* or the *Consultant* or the notice being given pursuant to subparagraph 3.5.1.3, the *Contractor* shall produce and present to the *Owner* and the *Consultant* a plan demonstrating how the *Contractor* will achieve the recovery of the last accepted schedule.

3.5.3 The *Contractor* is responsible for performing the *Work* within the *Contract Time*. Any schedule submissions revised from the accepted baseline construction schedule or revised schedule accepted by the *Owner* pursuant to GC 3.5 CONSTRUCTION SCHEDULE, during construction are not deemed to be approved extensions to the *Contract Time.* All extensions to the *Contract Time* must be made in accordance with the *Contract Documents*.

GC 3.6 SUPERVISION

Delete paragraph 3.6.1 in its entirety and replace with the following:

3.6.1 The *Contractor* shall employ a competent full-time superintendent, acceptable to the *Owner* and *Consultant*, who shall be in full time attendance at the *Place of Work* while the *Work* is being performed. The superintendent shall not be changed by the *Contractor* without valid reason which shall be provided in writing and shall not be changed without prior consultation with and agreement by the *Owner* and the *Consultant*. The *Contractor* shall replace the superintendent within 7 *Working Days* of the *Owner's* written notification, if the superintendent's performance is not acceptable to the *Owner*. The *Contractor* shall provide the *Owner* and the *Consultant* with the names, addresses and telephone numbers of the superintendent referred to in this paragraph 3.6.1 and other responsible persons who may be contacted for emergency and other reasons during non-working hours.

Delete paragraph 3.6.2 in its entirety and replace with the following:

3.6.2 The superintendent, and any project manager appointed by the *Contractor*, shall represent the *Contractor* at the *Place of Work* and shall have full authority to act on written instructions given by the *Consultant* and/or the *Owner*. Instructions given to the superintendent or the project manager shall be deemed to have been given to the *Contractor* and both the superintendent and any project manager shall have full authority to act on behalf of the *Contractor* and bind the *Contractor* in matters related to the *Contract*.

3.6.3 Add new paragraph 3.6.3, 3.6.4, 3.6.5 and 3.6.6 as follows:

The *Owner* may, at any time during the course of the *Work*, request the replacement of the appointed representative(s). Immediately upon receipt of the request, the *Contractor* shall make arrangements to appoint an acceptable replacement, which is approved by the *Owner*.

3.6.4 The supervisory staff assigned to the *Project* shall also be fully competent to implement efficiently all requirements for scheduling, coordination, field engineering, reviews, inspections and submittals defined in the *Specifications*, and have minimum 5 years documented "Superintendent/Project Management" experience.

3.6.5 The *Consultant and Owner* shall reserve the right to review the record of experience and credentials of supervisory staff assigned to the *Project* prior to commencement of the *Work*.

3.6.6 A superintendent assigned to the *Work* shall be "Gold Seal Certified" as per the Canadian Construction Association; or a superintendent that can demonstrate the requisite experience and success related to the *Project* to the sole satisfaction of the *Owner*.

GC 3.7 SUBCONTRACTORS AND SUPPLIERS

3.7.1.1 In paragraph 3.7.1.1 add to the end of the second line "including any warranties and service agreements which extend beyond the term of the *Contract*."

3.7.1.2 In subparagraph 3.7.1.2 after the words "the *Contract Documents*" insert the words "including any required surety bonding".

Delete paragraph 3.7.2. in its entirety and replace with the following:

3.7.2 Substitution of any *Subcontractor* and/or *Suppliers* after submission of the *Contractor's* bid will not be accepted unless a valid reason is given in writing to and approved by the *Owner*, whose approval may be arbitrarily withheld. The reason for substitution must be provided to the *Owner* and to the original *Subcontractor* and/or *Supplier* and the *Subcontractor* and/or *Supplier* shall be given the opportunity to reply to the *Contractor* and *Owner.* The *Contractor* shall be fully aware of the capability of each *Subcontractor* and/or *Supplier* included in its bid, including but not limited to technical ability, financial stability and ability to maintain the proposed construction schedule.

3.7.4 Change the word "shall" to "may" in the second line.

Add new paragraphs 3.7.7 and 3.7.8 as follows:

3.7.7 Where provided in the *Contract*, the *Owner* may assign to the *Contractor*, and the *Contractor* agrees to accept, any contract procured by the *Owner* for *Work* or services required on the *Project* that has been pre-tendered or pre-negotiated by the *Owner*, and upon such assignment, the *Owner* shall have no further liability to any party for such contract.

3.7.8 The *Contractor* covenants that each subcontract or supply contract which the *Contractor* enters into for the purpose of performing the *Work* shall expressly provide for the assignment thereof to the *Owner* (at the option of the *Owner*) and the assumption by the *Owner* of the obligations of the *Contractor* thereunder, upon the termination of the *Contract* and upon written notice by the *Owner* to the other parties to such subcontracts or supply contracts, without the imposition of further terms or conditions; provided, however, that until the *Owner* has given such notice, nothing herein contained shall be deemed to create any contractual or other liability upon the *Owner* for the performance of obligations under such subcontracts or supply contracts and the *Contractor* shall be fully responsible for all of its obligations and liabilities (if any) under such subcontracts and supply contracts.

GC 3.8 LABOUR AND PRODUCTS

3.8.2 Delete paragraph 3.8.2 and substitute with the following:

Products provided shall be new and shall conform to all current applicable specifications of the Canadian Standards Association, Canadian Standards Board or General Standards Board, ASTM, National Building Code, provincial and municipal building codes, fire safety standards, and all governmental authorities and regulatory agencies having jurisdiction at the *Place of the Work*, unless otherwise specified. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*. *Products* brought on to the *Place of the Work* by the *Contractor* shall be deemed to be the property of the *Owner*, but the *Owner* shall be under no liability for loss thereof or damage thereto arising from any cause whatsoever. The said *Products* shall be at the sole risk of the *Contractor*. Workmanship shall be, in every respect, first class and the *Work* shall be performed in accordance with the best modern industry practice.

3.8.3 Amend paragraph 3.8.3 by adding the words, "…, agents, *Subcontractors* and *Suppliers*…" after the word "employees" in the first line.

Add new paragraphs 3.8.4, 3.8.5, 3.8.6, 3.8.7, 3.8.8, 3.8.9 and 3.8.10 as follows:

3.8.4 Upon receipt of a written notice from the *Consultant*, the *Contractor* shall immediately dismiss, from the *Place of the Work*, tradesmen and labourers whose *Work* is unsatisfactory to the *Consultant* or who are considered by the *Consultant* to be unskilled or otherwise objectionable.

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3.8.5 The *Contractor* shall cooperate with the *Owner* and its representatives and shall take all reasonable and necessary actions to maintain stable and harmonious labour relations with respect to the *Work* at the *Place of the Work*, including cooperation to attempt to avoid *Work* stoppages, trade union jurisdictional disputes and other *Labour Disputes*. Any costs arising from labour disputes shall be at the sole expense of the *Contractor*.

3.8.7 The cost for overtime required beyond the normal *Working Day* to complete individual construction operations of a continuous nature, such as pouring or finishing of concrete or similar work, or *Work* that the *Contractor* elects to perform at overtime rates without the *Owner* requesting it, shall not be chargeable to the *Owner*.

3.8.8. All manufactured *Products* which are identified by their proprietary names or by part or catalogue number in the *Specifications* shall be used by the *Contractor*. No substitutes for such specified *Products* shall be used without the written approval of the *Owner* and the *Consultant*. Substitutes will only be considered by the *Consultant* when submitted in sufficient time to permit proper review and investigation. When requesting approval for the use of substitutes, the *Contractor* shall include in its submission any proposed change in the *Contract Price*. The *Contractor* shall use all proprietary *Products* in strict accordance with the manufacturer's directions. Where there is a choice of proprietary *Products* specified for one use, the *Contractor* may select any one of the *Products* so specified for this use.

3.3.9 No consideration will be given to claims by the *Contractor* of unsuitability or unavailability of any *Products*, nor to the *Contractor's* unwillingness to use, or to produce first class work with, any *Products*, or to provide the specified warranties or guarantees.

3.8.10 Materials, appliances, equipment and other *Products* are sometimes specified by reference to brand names, proprietary names, trademarks or symbols. In such cases, the name of a manufacturer, distributor, *Supplier* or dealer is sometimes given to assist the *Contractor* to find a source *Supplier*. This shall not relieve the *Contractor* from its responsibility from finding its own source of supply even if the source names no longer supplies the *Product* specified. If the *Contractor* is unable to obtain the specified *Product*, the *Contractor* shall supply a substitute product equal to or better than the specified *Product*, as approved by the *Consultant* with no extra compensation. Should the *Contractor* be unable to obtain a substitute *Product* equal to or superior to the specified *Product* and the *Owner* accepts a different Product, the *Contract Price* shall be adjusted accordingly, as approved by the *Consultant*.

GC 3.9 DOCUMENTS AT THE SITE

3.9.1 Delete paragraph 3.9.1 in its entirety and substitute the following:

The *Contractor* shall keep one copy of the current *Contract Documents*, *Supplemental Instructions*, contemplated *Change Orders*, *Change Orders*, *Change Directives*, cash allowance disbursement authorizations, reviewed *Shop Drawings*, submittals, reports and records of meeting at the *Place of the Work*, in good order and available to the *Owner* and *Consultant*.

GC 3.10 SHOP DRAWINGS

3.10.1 Delete paragraph 3.10.1 in its entirety and replace with the following:

The *Contractor* shall provide shop drawings as described in the *Contract Documents* and as the *Consultant* may reasonably request

3.10.9 Delete paragraph 3.10.9 in its entirety and substitute the following:

At the time of providing *Shop Drawings*, the *Contractor* shall advise the *Consultant* in writing of any deviations in *Shop Drawings* from the requirements of the *Contract Documents*. The *Consultant* shall indicate the acceptance of such deviation expressly in writing. Where manufacturers' literature is submitted in lieu of scaled drawings, it shall be clearly marked in ink, to indicate the specific items for which review is requested.

Add new paragraphs 3.10.13, 3.10.14, 3.10.15, 3.10.16, 3.10.17 and 3.10.18 as follows:

3.10.13 Reviewed *Shop Drawings* shall not authorize a change in the *Contract Price* and/or the *Contract Time*.

3.10.14 The *Contractor* shall prepare a *Shop Drawings* schedule acceptable to the *Owner* and the *Consultant* prior to the first application for payment. A draft of the proposed *Shop Drawings* schedule shall be submitted by the *Contractor* to the *Consultant* and the *Owner* for approval. The draft *Shop Drawings* schedule shall clearly indicate the phasing of *Shop Drawings* submissions. The *Contractor* shall periodically re-submit the *Shop Drawings* schedule to correspond to changes in the construction schedule.

3.10.15 Except where the parties have agreed to a different *Shop Drawings* schedule pursuant to paragraph 3.10.3, the *Contractor* shall comply with the requirements for *Shop Drawings* submissions stated in the *Specifications*.

3.10.16 The *Contractor* shall not use the term "by others" on *Shop Drawings* or other submittals. The related trade, *Subcontractor* or *Supplier* shall be stated.

3.10.17 Certain *Specifications* sections require the *Shop Drawings* to bear the seal and signature of a professional engineer. Such professional engineer must be registered in the jurisdiction of the *Place of the Work* and shall have expertise in the area of practice reflected in the *Shop Drawings*.

3.10.18 The *Consultant* will review and return *Shop Drawings* and submittals in accordance with the schedule agreed upon in paragraph 3.10.3, The *Contractor* shall allow the *Consultant* a minimum of 14 days to review *Shop Drawings* from the date of receipt. If resubmission of *Shop Drawings* is required, a further 14 day period is required for the *Consultant's* review.

GC 3.11 USE OF THE WORK

3.11.1 In the second line between the words "permits and "or" add", by direction of the *Owner* or *Consultant.*

3.11.3 Add new paragraph 3.11.3 as follows:

The *Owner* shall have the right to enter or occupy the *Work* in whole or in part for the purpose of placing fittings and equipment, or for other use before *Substantial Performance of the Work*, if, in the opinion of the *Consultant*, such entry and occupation does not prevent or substantially interfere with the *Contractor* in the performance of the *Contract* within the *Contract Time*. Such entry or occupation shall neither be considered as acceptance of the *Work*, nor in any way relieve the *Contractor* from its responsibility to complete the *Contract*.

GC 3.12 CUTTING AND REMEDIAL WORK

Add new paragraphs 3.12.5 and 3.12.6 as follows:

3.12.5 Unless specifically stated otherwise in the *Specifications*, the *Contractor* shall do all cutting and making good necessary for the proper installation and performance of the *Work.*

3.12.6 To avoid unnecessary cutting, the *Contractor* shall lay out its work and advise the *Subcontractors*, when necessary, where to leave holes for installation of pipes and other work.

GC 3.13 CLEAN UP

3.13.1 At the end of the paragraph 3.13.1, add the following:

Remove accumulated waste and debris at least once a week as a minimum or as required by the nature of the *Work.*

3.13.2 In paragraph 3.13.2, in the fourth line add the word "materials" between the word "tools" and the words "*Construction Equipment*".

3.13.3 In paragraph 3.13.3, in the first and second lines add the word "materials" between the word "tools" and the words "*Construction Equipment*".

Add new paragraphs 3.13.4, 3.13.5, 3.13.6 and 3.13.7 as follows:

3.13.4 In the event that the *Contractor* fails to remove waste and debris as provided in this GC 3.13, then the *Owner* or the *Consultant* may give the *Contractor* twenty-four (24) hours written notice to meet its obligations respecting clean up. Should the *Contractor* fail to meet its obligations pursuant to this GC 3.13 within the twenty-four (24) hour period next following delivery of the notice, the *Owner* may remove such waste and debris and deduct from payments otherwise due to the *Contractor*, the *Owner's* costs for such clean up, including a reasonable mark-up for administration costs.

3.13.5 The *Contractor* shall clean up garbage during and after construction, and maintain the site in a neat and orderly condition on a daily basis. Prior to leaving the site at the end of construction, the *Contractor* shall make good all damage to the building and its components caused by the performance of the *Work* or by any *Subcontractor* or *Supplier*. The *Contractor*

shall leave the site in a clean and finished state; remove all equipment and materials; remove all paint, stains, labels, dirt, etc. from the *Work*; and touch up all damaged painted areas.

3.13.6 Without limitation to or waiver of the *Owner's* other rights and remedies, the *Owner* shall have the right to back charge to the *Contractor* the cost of damage to the site caused by transportation in and out of the site by the *Contractor*, *Subcontractors* or *Suppliers*, if not repaired before final payment.

3.13.7 The *Contractor* shall dispose of debris at location and in a manner acceptable to the *Owner*, and authorities having jurisdiction in the area of the *Work* and the disposal area, and cover containers with tarpaulins tied in place to prevent scattering of debris on site and during transport.

GC 3.14 CONTRACTOR STANDARD OF CARE

Add a new General Condition 3.14 – CONTRACTOR STANDARD OF CARE as follows:

3.14.1 In performing its services and obligations under the *Contract*, the *Contractor* shall exercise the standard of care, skill and diligence that would normally be provided by an experienced and prudent contractor supplying similar services for similar projects. The *Contractor* acknowledges and agrees that throughout the *Contract*, the performance of the *Contractor's* obligations, duties and responsibilities shall be judged against this standard. The *Contractor* shall exercise the same standard of care, skill and diligence in respect of any *Products*, personnel or procedures which it may recommend to the *Owner*.

3.14.2 The *Contractor* further represents, covenants and warrants to the *Owner* that:

.1 the personnel it assigns to the *Project* are appropriately experienced;

.2 it has a sufficient staff of qualified and competent personnel to replace any of its appointed representatives, subject to the *Owner's* approval, in the event of death, incapacity, removal or resignation; and

.3 there are no pending, threatened or anticipated claims, liabilities or contingent liabilities that would have a material effect on the financial ability of the *Contractor* to perform its work under the *Contract*.

GC 3.15 OCCUPANCY OF THE WORK

3.15.1 The *Owner* reserves the right to take possession of and use for any intended purpose any portion or all of the undelivered portion of the *Project* even though the *Work* may not be substantially performed, provided that such taking possession and use will not interfere, in any material way, with the progress of the *Work*. The taking of possession or use of any such portion of the *Project* shall not be deemed to be the *Owner's* acknowledgement or acceptance of the *Work* or the *Project*, nor shall it relieve the *Contractor* of any of its obligations under the *Contract*.

3.15.2 Whether the *Project* contemplates *Work* by way of renovations in buildings which will be in use or be occupied during the course of the *Work* or where the *Project* involves *Work* that is adjacent to a structure which is in use or is occupied, the *Contractor*, without in any way limiting its responsibilities under the *Contract*, shall take all reasonable steps to avoid interference with fire exits, building access and egress, continuity of electric power and all other utilities, to suppress dust and noise and to avoid conditions likely to propagate mould or fungus of any kind and all other steps reasonably necessary to promote and maintain the safety and comfort of the users and occupants of such structures or adjacent structures.

GC 4.1 CASH ALLOWANCES

4.1.1 Delete the second sentence in paragraph 4.1.1

4.1.4 Delete paragraph 4.1.4 in its entirety and substitute the following:

Where the actual cost of the *Work* under any cash allowance exceeds the amount of the allowance, any unexpended amounts from other cash allowances shall be reallocated, at the *Consultant's* direction, to cover the shortfall, and, in that case, there shall be no additional amount added to the *Contract Price* for overhead and profit. Only where the actual cost of the *Work* under all cash allowances exceeds the total amount of all cash allowances shall the *Contractor* be compensated for the excess incurred and substantiated, plus an amount for overhead and profit on the excess only, as set out in the *Contract Documents*.

4.1.5 Delete paragraph 4.1.5 in its entirety and substitute the following:

The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the *Contract Price* by *Change Order* without any adjustment for the *Contractor's* overhead and profit on such amount.

Add new paragraphs 4.1.8 and 4.1.9 as follows:

4.1.8 The *Owner* reserves the right to call, or to have the *Contractor* call, for competitive bids for portions of the *Work*, which are to be paid for from cash allowances.

4.1.9 Cash allowances cover the net cost to the *Contractor* of services, *Products*, *Construction Equipment*, freight, unloading, handling, storage, installation, provincial sales tax, and other authorized expenses incurred in performing any *Work* stipulated under the cash allowances but does not include any *Value Added Taxes* payable by the *Owner* and the *Contractor.*

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

5.1.1 Delete paragraph 5.1.1 in its entirety.

5.1.2 Delete paragraph 5.1.2 in its entirety.

GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

Delete paragraph 5.2.2 in its entirety and substitute the following:

5.2.2 Applications for payment shall be dated the last day of each payment period, which is the last day of the month or an alternative day of the month agreed in writing by the parties. The amount claimed shall be for the value, proportionate to the amount of the *Contract*, or work performed and *Products* delivered and incorporated into the *Work* at that date. No amount claimed shall include products delivered and incorporated into the work, unless the products are free and clear of all security interests, liens and other claims of third parties.

Each application for payment, except the first, shall include a statutory declaration, in the CCDC 9A – 2001 form, up to the date of the application for payment, in a form approved by the Consultant. Each application for payment (including the first),shall also include:

.1 A certificate, issued by an agency or firm providing workers' compensation insurance to the *Contractor*, verifying that coverage is in force at the time of making the application for payment, and that coverage will remain in force for at least sixty (60) days thereafter.

.2 A declaration by the *Contractor* , in a form approved by the *Consultant*, verifying that the performance of the *Work* is in compliance with all applicable regulatory requirements respecting environmental protection, first safety, public safety and occupational health and safety.

.3 A pre-approved schedule of values, supplied by the *Contractor*, for Divisions 1 through 14 of the *Work*, aggregating the total amount of the *Contract Price.*

.4 A separate pre-approved schedule of values, supplied by each *Subcontractor*, for each of Division 15, 16, and 17 of the *Work*, aggregating the total amount of the *Contract Price.*

.5 Invoices to support all claims against the cash allowance.

.6 An acceptable construction schedule pursuant to GC 3.5.

5.2.3 Amend paragraph 5.2.3 by adding the following to the end of that paragraph:

No amount claimed shall include *Products* delivered to the *Place of the Work* unless the *Products* are free and clear of all security interests, liens, and other claims of third parties.

5.2.7 Delete existing paragraph 5.2.7:

Add new paragraphs 5.2.7, and 5.2.8 as follows:

5.2.7 The *Contractor* shall prepare and maintain current as-built drawings which shall consist of the *Drawings* and *Specifications* revised by the *Contractor* during the *Work*, showing changes to the *Drawings* and *Specifications*, which current as-built drawings shall be maintained by the *Contractor* and made available to the *Consultant* for review with each application for progress payment. The *Consultant* shall retain a reasonable amount for the value of the as-built drawings not presented for review.

5.2.8 Prior to each application for payment, the *Contractor* and the *Consultant* shall jointly review the progress of the *Work*.

GC 5.3 PROGRESS PAYMENT

5.3.1.2 In the first sentence amend as follows: After the words "issue to the *Owner*" delete "and copy to the *Contractor*". After the words "after the receipt of the" add "complete".

5.3.1.3 Delete subparagraph 5.3.1.3 in its entirety and substitute as follows:

the *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement – PAYMENT no later than 30 calendar days after the date of a complete certificate of payment is issued by the *Consultant*

Add new paragraphs 5.3.2 and 5.3.3 as follows:

5.3.2 If the *Contractor* fails to provide all documentation as required by GC 5.2 – APPLICATIONS FOR PROGRESS PAYMENT, the *Contractor* or *Owner* shall be entitled to return the application for progress payment to the *Contractor* for completion. The 10 day review period by the *Consultant* and 30 day payment period by the *Owner* will commence upon receipt of a complete application for progress payment.

5.3.3 Payment will be mailed to the *Contractor*. The payment date shall be the date the cheque is mailed. Delay resulting from mail shall not be used in calculating payment date.

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

5.4.2 Delete paragraph 5.4.2 in its entirety and substitute the following:

The *Consultant* will review the *Work* to verify the validity of the application and shall promptly, and in any event, no later than 30 calendar days after receipt of the *Contractor's* complete deficiency list and application, the *Consultant* shall:

.1 prepare a final deficiency list incorporating all items to be completed or corrected. Each item is to have an indicated value for correction or completion. Determination of the value is defined in GC 5.10 – DEFICIENCY HOLDBACK. The final deficiency list complete with values is to be included with the *Consultant's* draft verification and shall be reviewed with the *Owner* prior to 5.4.2.2.

.2 having completed 5.4.2.1, the *Consultant* shall:

.1 advise the *Contractor* in writing that the *Work* or the designated portion of the *Work* is not substantially performed and give reasons why, or

.2 state the date of *Substantial Performance of the Work* in a certificate and issue a copy of that certificate to each the *Owner* and the *Contractor*.

5.4.3 Delete paragraph 5.4.3 in its entirety and substitute the following:

Following the issuance of the certificate of *Substantial Performance of the Work*, the following shall apply to completing the *Work*:

.1 *Contractor* is to complete the *Work* within sixty (60) calendar days.
.2 No payments will be processed between *Substantial Performance of the Work* and the completion of the *Work*.

.3 The *Owner* reserves the right to contract out any or all unfinished *Work* if it has not been completed within sixty (60) days of *Substantial Performance of the Work* without prejudice to any other right or remedy and without affecting the warranty period. The cost of completing the *Work* shall be deducted from the *Contract Price.*

Add new paragraphs 5.4.4, 5.4.5 and 5.4.6:

5.4.4 Within the time prescribed by the construction/builder's lien legislation in force at the *Place of the Work*, or where there is no legislation or no time prescribed, within a reasonable time of receiving a copy of the certificate of *Substantial Performance of the Work* signed by the *Consultant*, the *Contractor* shall take whatever steps are required to publish or post a signed copy of the certificate, as is required by such legislation. If the *Contractor* fails to comply with this provision, the *Owner* may take the required steps pursuant to the legislation and charge the *Contractor* for any costs so incurred.

5.4.5 Prior to submitting its written application for *Substantial Performance of the Work*, the *Contractor* shall submit to the *Consultant* all:

.1 guarantees;
.2 warranties;
.3 certificates;
.4 final testing and balancing reports;
.5 distribution system diagrams;
.6 spare parts;
.7 maintenance manuals;
.8 samples;
.9 reports and correspondence from authorities having jurisdiction in the *Place of the Work*;
.10 shop drawings;
.11 inspection certificates;
.12 marked-up record or as-built drawings from the construction trailer.

and other materials or documentation required to be submitted under the *Contract*, together with written proof acceptable to the *Owner* and the *Consultant* that the *Work* has been substantially performed in conformance with the requirements of municipal, governmental, and utility authorities having jurisdiction in the *Place of the Work*. The *Consultant* shall refuse to certify *Substantial Performance of the Work* if the submittals referred to in this paragraph 5.4.5 are not provided by the *Contractor*.

5.4.6 The *Contractor* shall submit full and complete digital record or as-built drawings to the *Consultant* within forty-five (45) days of the issuance of the certificate of *Substantial Performance of the Work* and the *Owner* shall be at liberty to withhold, from amounts otherwise payable to the *Contractor*, an amount not to exceed one (1) percent of the *Contract Price* as security for the obligation of the *Contractor* to deliver such digital record or as built drawings.

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

5.5.1.1. Add to end of sentence ", and the application by the *Contractor* shall be accompanied by:

.1 a certificate, issued by an agency or firm providing workers' compensation insurance to the *Contractor*, verifying that coverage is in force at the time of making application for payment, and that coverage will remain in force for at least sixty (60) days thereafter; and,

.2 a declaration by the *Contractor*, in a form approved by the *Consultant*, verifying performance of the *Work* in compliance with all applicable regulatory requirements respecting environmental protection, fire safety, public safety and occupational health and safety.

Add new subparagraph 5.5.1.3 as follows

5.5.1.3 submit a statement that no written notices of liens have been received by it

5.5.2 Amend paragraph 5.5.2 by adding the following sentence to the end of that paragraph:

A reserve fund may be retained by the *Owner* to secure the correction of deficiencies and/or warranty claims. Included in the reserve fund would be all *Consultant* and *Owner* costs related to the correction of deficiencies and/or warranty claims.

5.5.3 Delete paragraph 5.5.3 in its entirety.

5.5.5 Delete paragraph 5.5.5 in its entirety.

GC 5.6 PROGRESSIVE RELEASE OF HOLDBACK

Delete GC 5.6 in its entirety.

GC 5.7 FINAL PAYMENT

5.7.1 Delete paragraph 5.7.1 in its entirety and substitute as follows:

When the *Contractor* considers that the *Work* is completed, as defined in the lien legislation applicable to the *Place of the Work* or if such definition does not exist, in accordance with other applicable legislation, industry practice or provisions which may be agreed to between the parties, the *Contractor* shall submit an application for final payment. The *Contractor's* application for final payment shall be accompanied by any documents or materials not yet delivered pursuant to paragraph 5.4.5, together with complete and final as-built drawings and:

.1 the Contractor's written request for release of the deficiency holdback, including a statement that no written notices of lien have been received by it;

.2 a Statutory Declaration CCDC 9A-2001;

.3 the evidence of workers' compensation compliance required by GC 10.4.1.

The *Work* shall be deemed not to be completed until all of the aforementioned documents have been delivered, and the *Owner* may withhold payment in respect of the delivery of any documents in an amount determined by the *Consultant* in accordance with the provisions of GC 5.8 - WITHHOLDING OF PAYMENT.

5.7.2 Delete from the first line of paragraph 5.7.2 the words, "calendar days" and substitute the words "*Working Days*".

5.7.4 Delete from the second line of paragraph 5.7.4 the words, " 5 calendar days after the issuance" and substitute the words "30 calendar days after receipt of".

GC 5.8 WITHHOLDING OF PAYMENT

Delete paragraph 5.8.1 and replace with the following:

5.8.1 If because of conditions reasonably beyond the control of the *Contractor*, there are items of work that cannot be performed, payment in full for that portion of the *Work* which has been performed as certified by the *Consultant* shall not be withheld or delayed by the *Owner* on account thereof, but the *Owner* may withhold, until the remaining portion of the *Work* is finished, only such an amount that the *Consultant* determines is sufficient and reasonable to cover the cost of performing such remaining work.

GC 5.10 DEFICIENCY HOLDBACK

Add a new General Condition 5.10 as follows:

5.10.1 Notwithstanding any provisions contained in the *Contract Documents* concerning certification and release of monies to the *Contractor*, the *Owner* reserves the right to establish a deficiency holdback, at the time of the review for *Substantial Performance*, based on a 200% dollar value of the deficiencies listed by the *Consultant*. The value of work outstanding for the calculation of *Substantial Performance of the Work* under the *Construction Lien Act* (Ontario) shall utilize the 100% dollar value. No individual deficiency will be valued at less than two hundred dollars ($200.00). The *Owner* shall retain the entire deficiency holdback amount until completion of all of the deficiencies listed by the *Consultant* to the satisfaction of the *Consultant*.

GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

Add new paragraphs 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.1.7 and 6.1.8 as follows:

6.1.3 The *Contractor* agrees that changes resulting from construction coordination, including but not limited to, site surface conditions, site coordination, and *Subcontractor and Supplier* coordination are included in the *Contract Price* and the *Contractor* shall be precluded from making any claim for a change in the *Contract Price* as a result of such changes.

6.1.4 Labour costs shall be actual, prevailing rates at the *Place of the Work* paid to workers, plus statutory charges on labour including WSIB, unemployment insurance, Canada pension, vacation pay, hospitalization and medical insurance. The *Contractor* shall provide these rates, when requested by the *Consultant*, for review and/or agreement.

6.1.5 Quotations for changes to the *Work* shall be accompanied by itemized breakdowns together with detailed, substantiating quotations or cost vouchers from *Subcontractors* and *Suppliers*, submitted in a format acceptable to the *Consultant* and including any costs associated with extensions in *Contract Time.*

6.1.6 When both additions and deletions covering related *Work* or substitutions are involved in a change to the *Work*, payment, including *Overhead* and profit, shall be calculated on the basis of the net difference, if any, with respect to that change in the *Work.*

6.1.7 No extension to the *Contract Time* shall be granted for changes in the *Work* unless the *Contractor* can clearly demonstrate that such changes significantly alter the overall construction schedule submitted at the commencement of the *Work.* Extensions of *Contract Time* and all associated costs, if approved pursuant to GC 3.4.2, are to be included in the relevant *Change Order.*

6.1.8 When a change in the *Work* is proposed or required, the *Contractor* shall within 10 calendar days submit to the *Consultant* for review a claim for a change in *Contract Price* and/or *Contract Time.* Should 10 calendar days be insufficient to prepare the submission, the *Contractor* shall within 5 calendar days, advise the *Consultant* in writing of the proposed date of submission of the claim. Claims submitted after the dates prescribed herein will not be considered.

GC 6.2 CHANGE ORDER

6.2.1 Add after the last sentence in the paragraph:

The adjustment in the *Contract Time* and the *Contract Price* shall include an adjustment, if any, for delay or for the impact that the change in the *Work* has on the *Work* of the *Contractor*, and once such adjustment is made, the *Contractor* shall be precluded from making any further claims for delay or impact with respect to the change in the *Work.*

Add new paragraph 6.2.3 as follows:

6.2.3 The value of a change shall be determined in one or more of the following methods as directed by the *Consultant*.

.1 by estimate and acceptance of a lump sum;

.2 by negotiated unit prices which include the *Contractor's Overhead* and profit, or;

.3 by the actual cost to the *Owner*, such costs to be the actual cost after all credits included in the change have been deducted, plus the following ranges of mark-up on such costs:

.1 for *Change Orders* with a value of $0 to $15,000 the total *Subcontractor/Supplier* mark-up including *Overhead* and profit shall be 10% and the total *Contractor* mark-up including overhead and profit shall be 5%.

.2 For *Change Orders* in excess of $15,000, the total *Subcontractor/Supplier* mark-up including *Overhead* and profit shall be 5% and the total *Contractor* mark-up including *Overhead* and profit shall be 3%.

Add new paragraph 6.2.4 as follows:

6.2.4 All quotations will be submitted in a complete manner listing:

.1 quantity of each material,
.2 unit cost of each material,
.3 man hours involved,
.4 cost per hour,
.5 *Subcontractor* quotations submitted listing items 1 to 4 above and item 6 below.
.6 mark-up

Add new paragraph 6.2.5 as follows:

6.2.5 The *Owner* and the *Consultant* will not be responsible for delays to the *Work* resulting from late, incomplete or inadequately broken down valuations submitted by the *Contractor.*

GC 6.3 CHANGE DIRECTIVE

6.3.6.1 Amend paragraph 6.3.6.1 by deleting the final period and adding as follows:

.1 Ten percent (10%) for profit plus five percent (5%) for overhead on work by the *Contractor's* own forces up to the value of $15,000 and five percent (5%) for profit plus three percent (3%) for *Overhead* on work by the *Contractor's* own forces in excess of $15,000 and,

.2 Ten percent (10%) fee on amounts paid to *Subcontractors* or *Suppliers* under subparagraph 6.3.7.9 for changes up to the value of $15,000 and five percent (5%) on changes over $15,000.

Unless a *Subcontractor's* or *Supplier's* price has been approved by the *Owner*, the *Subcontractor* or *Supplier* shall be entitled to its actual net cost as determined in accordance with paragraph 6.3.7, plus ten percent (10%) for profit and five percent (5%) for *Overhead* on such actual net cost for changes in the *Work*, up to the value of $15,000 and five percent (5%) for profit and three percent (3%) for overhead on such actual net cost changes in the *Work* in excess of $15,000.

6.3.6.2 Delete paragraph 6.3.6.2 and replace it with the following:

If a change in the *Work* results in a net decrease in the *Contract Price* in excess of $15,000 the amount of the credit shall be the net cost, with deduction for *Overhead* and profit. If a change in the *Work* results in a net decrease in the *Contract Price* of $15,000 or less, the amount of the credit shall be the net cost, without deduction for *Overhead* or profit.

6.3.7.1 In subparagraph 6.3.7.1 insert "while directly engaged in the work attributable to the change" after the words "in the direct employ of the *Contractor*".

6.3.7 At the end of paragraph 6.3.7 add the following:

All other costs attributable to the change in the *Work* including the costs of all administrative or supervisory personnel are included in *Overhead* and profit calculated in accordance with the provisions of paragraph 6.1.5 of GC6.1 – OWNER'S RIGHT TO MAKE CHANGES.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

6.4.1 Delete paragraph 6.4.1 and replace with the following:

6.4.1.1 Prior to the submission of the bid on which the *Contract* was awarded, the *Contractor* confirms that it carefully investigated the *Place of the Work* and carried out such tests as it deemed appropriate and, in doing so, applied to that investigation the degree of care and skill required by paragraph 3.14.1.

6.4.1.2 The *Contractor* is deemed to assume all risk of conditions or circumstances now existing or arising in the course of the *Work* which could make the work more expensive or more difficult to perform than was contemplated at the time the *Contract* was executed. No claim by the *Contractor* will be considered by the *Owner* or the *Consultant* in connection with

conditions which could reasonably have been ascertained by such investigation or other due diligence undertaken prior to the execution of the *Contract*.

6.4.2 Amend paragraph 6.4.2 by adding a new first sentence as follows:

Having regard to paragraph 6.4.1, if the *Contractor* believes that the conditions of the *Place of the Work* differ materially from those reasonably anticipated, differ materially from those indicated in the *Contract Documents* or were concealed from discovery notwithstanding the conduct of the investigation described in paragraph 6.4.1, it shall provide the *Owner* and the *Consultant* with *Notice in Writing* no later than five (5) *Working Days* after the first observation of such conditions.

Amend the existing second sentence of paragraph 6.4.2 in the second line, following the word "materially" by adding the words "or were concealed from discovery notwithstanding the conduct of the investigation described in paragraph 6.4.1,"

6.4.3 Delete paragraph 6.4.3 in its entirety and substitute the following:

If the *Consultant* makes a finding pursuant to paragraph 6.4.2 that no change in the *Contract Price* or the *Contract Time* is justified, the *Consultant* shall report in writing the reasons for this finding to the *Owner* and the *Contractor*.

Add new paragraph 6.4.5 as follows:

6.4.5 No claims for additional compensation or for an extension of *Contract Time* shall be allowed if the *Contractor* fails to give *Notice in Writing* to the *Owner* or *Consultant*, as required by paragraph 6.4.2.

GC 6.5 DELAYS

6.5.1 Delete the words after the word "for" in the fourth line of paragraph 6.5.1, and add the words "…reasonable direct costs directly flowing from the delay, but excluding any consequential, indirect or special damages (including, without limitation, loss of profits, loss of opportunity or loss of productivity)."

6.5.2 Delete the words after the word "for" in the fourth line of paragraph 6.5.2, and add the words "…reasonable direct costs directly flowing from the delay, but excluding any consequential, indirect or special damages (including, without limitation, loss of profits, loss of opportunity or loss of productivity)."

6.5.3 Delete paragraph 6.5.3 in its entirety and replace with the following:

If the *Contractor* is delayed in the performance of the *Work* by *Force Majeure*, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. The extension of time shall not be less than the time lost as a result of the event causing the delay, unless the *Contractor* agrees to a shorter extension. The *Contractor* shall not be entitled to payment for costs incurred by such delays unless such delays result from the actions of the *Owner*.

Delete paragraph 6.5.4 in its entirety and replace with the following:

6.5.4 No extension or compensation shall be made for delay or impact on the *Work* unless notice in writing of a claim is given to the *Consultant* not later than ten (10) *Working Days* after the commencement of the delays or impact on the *Work*, provided however, that, in the case of a continuing cause of delay or impact on the *Work*, only one notice of claim shall be necessary.

Add new paragraphs 6.5.6, 6.5.7 and 6.5.8 as follows:

6.5.6 If the *Contractor* is delayed in the performance of the *Work* by an act or omission of the *Contractor* or anyone directly or indirectly employed or engaged by the *Contractor*, or by any cause within the *Contractor's* control, then the *Contract Time* may be extended for such reasonable time as the *Owner* may decide in consultation with the *Consultant* and the *Contractor*. The *Owner* shall be reimbursed by the *Contractor* for all reasonable costs incurred by the *Owner* as the result of such delay, including, but not limited to, the cost of all additional services required by the *Owner* from the *Consultant* or any sub-consultants, project managers, or others employed or engaged by the *Owner*, and in particular, the costs of the *Consultant's* services during the period between the date of *Substantial Performance of the Work* stated in Article A-1 herein, as the same may be extended through the provision of these General Conditions, and any later or actual date of *Substantial Performance of the Work* achieved by the *Contractor*.

6.5.7 Without limiting the obligations of the *Contractor* described in GC 3.2 – CONSTRUCTION BY OWNER OR OTHER CONTRACTORS or GC 9.4 – CONSTRUCTION SAFETY, the *Owner* or *Consultant* may, by notice in writing, direct the *Contractor* to stop the *Work* where the *Owner* or *Consultant* determines that there is an imminent risk to the safety of persons or property at the *Place of the Work*. In the event that the *Contractor* receives such notice, it shall immediately stop the *Work* and secure the site. The *Contractor* shall not be entitled to an extension of the *Contract Time* or to an increase in the *Contract Price* unless the resulting delay, if any, would entitle the *Contractor* to an extension of the *Contact Time* or the reimbursement of the *Contractor's* costs as provided in paragraphs 6.5.1, 6.5.2 or 6.5.3.

6.5.8 No claim for delay shall be made and the *Contract Time* shall not be extended due to climatic conditions or arising from the *Contractor's* efforts to maintain the *Contract* schedule.

GC 6.6 CLAIMS FOR A CHANGE IN THE CONTRACT PRICE

Delete GC 6.6 in its entirety.

GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT

Revise the heading to read **"OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT"**

Delete paragraph 7.1.2 and replace with the following:

7.1.2 If the *Contractor* should neglect to prosecute the *Work* properly, fails or neglects to maintain the latest schedule provided pursuant to GC 3.5, or otherwise fails to comply with the requirements of the *Contract*, and if the *Consultant* has given a written statement to the *Contractor* that sufficient cause exists to justify such action, the *Owner* may notify the *Contractor*, in writing, that the *Contractor* is in default of the *Contractor's* contractual obligations and instruct the *Contractor* to correct the default in the five (5) *Working Days* immediately following the receipt of such notice.

Add a new subparagraph 7.1.3.4 as follows:

7.1.3.4 An "acceptable schedule" as referred to in subparagraph 7.1.3.2. means a schedule approved by the *Consultant* and the *Owner* wherein the default can be corrected within the balance of the *Contract Time* and shall not cause delay to any other aspect of the *Work* or the work of other contractors, and in no event shall it be deemed to give a right to extend the *Contract Time*.

7.1.4.1 Delete sentence and replace with the following:

Correct such default and deduct the cost, including *Owner's* expenses, thereof from any payment then or thereafter due the *Contractor*.

7.1.5.3 In subparagraph 7.1.5.3 delete the words: "however, if such cost of finishing the *Work* is less than the unpaid balance of the *Contract Price*, the *Owner* shall pay the *Contractor* the difference;"

Delete paragraph 7.1.6 in its entirety and add new paragraphs 7.1.6, 7.1.7, 7.1.8, 7.1.9 and 7.1.10 as follows:

7.1.6 In addition to its right to terminate the Contract set out herein, the *Owner* may terminate this *Contract* at any time for any other reason and without cause upon giving the *Contractor* fifteen (15) *Working Days Notice in Writing* to that effect. In such event, the *Contractor* shall be entitled to be paid for all *Work* performed including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the termination of the *Contract*, but in no event shall the *Contractor* be entitled to be compensated for any loss of profit on unperformed portions of the *Work*, or indirect, special, or consequential damages incurred.

7.1.7 The *Owner* may suspend *Work* under this *Contract* at any time for any reason and without cause upon giving the *Contractor Notice in Writing* to that effect. In such event, the *Contractor* shall be entitled to be paid for all *Work* performed to the date of suspension and be compensated for all actual costs incurred arising from the suspension, including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor*

may have sustained as a result of the suspension of the *Work*, but in no event shall the *Contractor* be entitled to be compensated for any indirect, special, or consequential damages incurred. In the event that the suspension continues for more than thirty (30) calendar days, the *Contract* shall be deemed to be terminated and the provisions of paragraph 7.1.6 shall apply.

7.1.8 In the case of either a termination of the *Contract* or a suspension of the *Work* under GC 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK, OR TERMINATE THE CONTRACT or GC 7.2 - CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* shall use its best commercial efforts to mitigate the financial consequences to the *Owner* arising out of the termination or suspension, as the case may be.

7.1.9 Upon the resumption of the *Work* following a suspension under GC 7.1 - OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT or GC 7.2 - CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* will endeavour to minimize the delay and financial consequences arising out of the suspension.

7.1.10 The *Contractor's* obligations under the *Contract* as to quality, correction, and warranty of the *Work* performed by the *Contractor* up to the time of termination or suspension shall continue after such termination of the *Contract* or suspension of the *Work*.

GC 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

7.2.2 Delete paragraph 7.2.2 in its entirety.

7.2.3.1 Delete subparagraph 7.2.3.1 in its entirety.

7.2.3.2 Delete subparagraph 7.2.3.2 in its entirety

7.2.3.3 Delete subparagraph 7.2.3.3 in its entirety.

7.2.3.4 In subparagraph 7.2.3.4, delete the words "except for GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER".

Renumber paragraph 7.2.5 as paragraph 7.2.6. Add a new paragraph 7.2.5 as follows:

7.2.5 If the default cannot be corrected within the 5 *Working Days* specified in paragraph 7.2.4, the *Owner* shall be deemed to have cured the default if it:

.1 commences correction of the default within the specified time;

.2 provides the *Contractor* with an acceptable schedule for such correction; and,

.3 completes the correction in accordance with such schedule.

Delete paragraph 7.2.6 entirely and replace with the following:

7.2.6 If the *Contractor* terminates the *Contract* under the conditions described in GC 7.2 – CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* shall be entitled to be paid for all *Work* performed to the date of termination, as determined by the *Consultant*. The *Contractor* shall also be entitled to recover the direct costs associated with termination, including the costs of demobilization and losses sustained on *Products* and *Construction Equipment*. The *Contractor* shall not be entitled to any recovery for any special, indirect or consequential losses, including loss of profit.

Add new paragraphs 7.2.7, 7.2.8 and 7.2.9 as follows

7.2.7 The *Contractor* shall not be entitled to give notice of the *Owner's* default or terminate the *Contract* in the event the *Owner* withholds certificates or payment or both in accordance with the *Contract* because of:

(a) the *Contractor's* failure to pay all legitimate claims promptly, or
(b) the failure of the *Contractor* to discharge construction liens which are registered against the title to the *Place of the Work.*

7.2.8 The *Contractor's* obligations under the *Contract* as to quality, correction and warranty of the *Work* performed by the *Contractor* up to the effective date of termination shall continue in force and shall survive termination by the *Contractor* in accordance with paragraph 7.2.4.

7.2.9 If the *Contractor* suspends the *Work* or terminates the *Contract* as provided for in GC 7.2 – CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the *Contractor* shall ensure the site and the *Work* are left in a safe, secure condition as required by authorities having jurisdiction at the *Place of the Work* and the *Contract Documents*.

GC 8.1 AUTHORITY OF THE CONSULTANT

Delete paragraph 8.3.1 in its entirety and substitute as follows:

8.1.3 If a dispute is not resolved promptly, the *Consultant* will give such instruction as in the Consultant's opinion are necessary for the proper performance of the Work and to prevent delays pending settlement of the dispute. The parties shall act immediately according to such instructions, it being understood that by doing so neither party will jeopardize any claim the party may have.

GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION

8.2.1 Amend paragraph 8.2.1 by changing part of the second line from "shall appoint a *Project Mediator*" to "may appoint a *Project Mediator,* except that such an appointment shall only be made if both the *Owner* and the *Contractor* agree."

8.2.4 Amend paragraph 8.2.4 by changing part of the second line from "the parties shall request the *Project Mediator"* to "and subject to paragraph 8.2.1 the parties may request the *Project Mediator"*.

Delete paragraphs 8.2.6, 8.2.7 and 8.2.8 in their entirety.

Add new paragraph 8.2.6 as follows:

8.2.6 The dispute may be finally resolved by arbitration under the Rules for Arbitration of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing, provided that both the *Contractor* and the *Owner* agree. If the *Contractor* and the *Owner* agree to resolve the dispute by arbitration, the arbitration shall be conducted in the jurisdiction of the *Place of the Work*.

GC 9.1 PROTECTION OF WORK AND PROPERTY

Delete subparagraph 9.1.1.1 in its entirety and substitute the following:

9.1.1.1 errors in the *Contract Documents* which the *Contractor* could not have discovered applying the standard of care described in paragraph 3.14.1;

Delete paragraph 9.1.2 in its entirety and substitute as follows:

9.1.2 Before commencing any *Work*, the *Contractor* shall determine the locations of all underground or hidden utilities and structures indicated in or inferable from the *Contract Documents*, or that are inferable from an inspection of the *Place of the Work* exercising the degree of care and skill described in paragraph 3.14.1.

Add new paragraph 9.1.5 as follows:

9.1.5 With respect to any damage to which paragraphs 9.1.3 or 9.1.4 apply, the *Contractor* shall neither undertake to repair or replace any damage whatsoever to the work of other contractors, or to adjoining property, nor acknowledge that the same was caused or occasioned by the *Contractor*, without first consulting the *Owner* and receiving written instructions as to the course of action to be followed from either the *Owner* or the *Consultant*. Where, however, there is danger to life, the environment, or public safety, the *Contractor* shall take such emergency action as it deems necessary to remove the danger.

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

Add a new subparagraph 9.2.5.5 as follows:

9.2.5.5 in addition to the steps described in subparagraph 9.2.5.3, take any further steps it deems necessary to mitigate or stabilize any conditions resulting from encountering toxic or hazardous substances or materials.

9.2.6 Add the following to paragraph 9.2.6, after the word "responsible" in the second line:

…or whether any toxic or hazardous substances or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the *Contractor* or anyone for whom the *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damages to the property of the *Owner* or others,**…**

9.2.8 Add the following to paragraph 9.2.8, after the word "responsible" in the second line:

…or whether any toxic or hazardous substances or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the *Contractor* or anyone for whom the *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damages to the property of the *Owner* or others**,…**

Add new paragraphs 9.2.10 and 9.2.11 as follows:

9.2.10 The *Contractor*, *Subcontractors* and *Suppliers* shall not bring on to the *Place of the Work* any toxic or hazardous substances and materials except as required in order to perform the *Work*. If such toxic or hazardous substances or materials are required, storage in quantities sufficient to allow work to proceed to the end of any current work week only shall be permitted. All such toxic and hazardous materials and substances shall be handled and disposed of only in accordance with all laws and regulations that are applicable at the *Place of the Work*.

9.2.11 The *Contractor* shall indemnify and hold harmless the *Owner*, its parent, subsidiaries and affiliates, the *Consultant* and their respective partners, officers, directors, agents and employees from and against any and all liabilities, costs, expenses, and claims resulting from bodily injury, including death, and damage to property of any person, corporation or other body politic, that arises from the use by the *Contractor*, *Subcontractors* and *Suppliers* of any toxic or hazardous substances or materials at the *Place of the Work*.

GC 9.4 CONSTRUCTION SAFETY

Delete paragraph 9.4.1 in its entirety and substitute as follows:

9.4.1 The *Contractor* shall be solely responsible for construction safety at the *Place of the Work* and for compliance with the rules, regulations, and practices required by the applicable construction health and safety legislation and shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the *Work*.

Add new paragraphs 9.4.2 to 9.4.10 as follows:

9.4.2 Prior to the commencement of the *Work*, the *Contractor* shall submit to the *Owner*:

.1 the evidence of workers' compensation compliance required by GC 10.4.1;

.2 copies of the *Contractor's* insurance policies having application to the *Project* or certificates of insurance, at the option of the *Owner*;

.3 documentation setting out the *Contractor's* in-house safety programs;

.4 copies of any documentation or notices to be filed or delivered to the authorities having jurisdiction for the regulation of occupational health and safety at the *Place of the Work*.

9.4.3 The *Contractor* shall indemnify and save harmless the *Owner*, its agents, trustees, officers, directors, employees, consultants, successors, appointees, and assigns from and against the consequences of any and all safety infractions committed by the *Contractor* under the occupational health and safety legislation in force at the *Place of the Work* including the payment of legal fees and disbursements on a substantial indemnity basis.

9.4.4 The *Owner* undertakes to include in its contracts with other contractors and in its instructions to its own forces the requirement that the other contractor or its own forces, as the case may be, comply with the policies and procedures of and the directions and instructions from the *Contractor* with respect to occupational health and safety and related matters.

9.4.5 If the *Owner* is of the reasonable opinion that the *Contractor* has not taken such precautions as are necessary to ensure compliance with the requirements of paragraph 9.4.1, the *Owner* may take any remedial measures which it deems necessary, including stopping the performance of all or any portion of the *Work*, and the *Owner* may use its employees, the *Contractor*, any *Subcontractor* or any other contractors to perform such remedial measures.

9.4.6 The *Contractor* shall file any notices or any similar document required pursuant to the *Contract* or the safety regulations in force at the *Place of the Work*. This duty of the *Contractor* will be considered to be included in the *Work* and no separate payment therefore will be made to the *Contractor*.

9.4.7 Unless otherwise provided in the *Contract Documents*, the *Contactor* shall develop, maintain and supervise for the duration of the *Work* a comprehensive safety program that will effectively incorporate and implement all required safety precautions. The program shall, at a minimum, respond fully to the applicable safety regulations and general construction practices for the safety of persons or property, including, without limitation, any general safety rules and regulations of the *Owner* and any workers' compensation or occupational health and safety statutes or regulations in force at the *Place of the Work*.

9.4.8 The Contractor shall provide a copy of the safety program described in paragraph 9.4.7 hereof to the *Consultant* for delivery to the *Owner* prior to the commencement of the *Work*, and shall, ensure, as far as it is reasonably practical to do so, that every employer and worker performing work in respect of the *Project* complies with such program.

9.4.9 The *Contractor* shall arrange regular safety meetings, and shall supply and maintain, at its own expense, at its office or other well-known place at the job site, safety equipment necessary to protect the workers and general public against accident or injury as prescribed by the authorities having jurisdiction at the *Place of the Work*, including, without limitation, articles necessary for administering first-aid to any person and an emergency procedure for the immediate removal of any inured person to a hospital or a doctor's care.

9.4.10 The *Contractor* shall promptly report in writing to the *Owner* and the *Consultant* all accidents of any sort arising out of or in connection with the performance of the *Work*, whether on or adjacent to the job site, giving full details and statement of witnesses. If death or serious injuries or damages are caused, the accident shall be promptly reported by the *Contractor* to the *Owner* and the *Consultant* by telephone or messenger in addition to any reporting required under the applicable safety regulations.

GC 9.5 MOULD

Delete subparagraph 9.5.3.3 and replace with the following:

9.5.3.3 extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the *Owner*. If, in the opinion of the *Consultant*, the *Contractor* has been delayed in performing the *Work* and/or has incurred additional costs under paragraph 9.5.1.2, the *Owner* shall reimburse the *Contractor* for the reasonable costs incurred as a result of the delay and as a result of taking those steps, and

GC 10.1 TAXES AND DUTIES

10.1.2 Amend paragraph 10.1.2 by adding the following sentence to the end of the paragraph:

For greater certainty, the *Contractor* shall not be entitled to any mark-up for overhead or profit on any increase in such taxes and duties and the *Owner* shall not be entitled to any credit relating to mark-up for overhead or profit on any decrease in such taxes. The *Contractor* shall provide a detailed breakdown of additional taxes if requested by the *Owner* in a form satisfactory to the Owner.

Add new paragraph 10.1.3 as follows:

10.1.3 Where the *Owner* is entitled to an exemption or a recovery of sales taxes, customs duties, excise taxes or *Value Added Taxes* applicable to the *Contract*, the *Contractor* shall, at the request of the *Owner*, assist with the application for any exemption, recovery or refund of all such taxes and duties and all amounts recovered or exemptions obtained shall be for the sole benefit of the *Owner*. The *Contractor* agrees to endorse over to the *Owner* any cheques received from the federal or provincial governments, or any other taxing authority, as may be required to give effect to this paragraph.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

10.2.5 Amend paragraph 10.2.5 by addition the words "Subject to paragraph 3.4" at the beginning of the paragraph. Add the following to the end of the second sentence:

…and no further *Work* on the affected components of the *Contract* shall proceed until these directives have been obtained by the *Contractor* from the *Consultant*.

10.2.6 Amend paragraph 10.2.6 by adding the following sentence to the end of the paragraph:

In the event the *Owner* suffers loss or damage as a result of the *Contractor's* failure to comply with paragraph 10.2.5 and notwithstanding any limitations described in paragraph 12.1.1, the *Contractor* agrees to indemnify and to hold harmless the *Owner* and the *Consultant* from and against any claims, demands, losses, costs, damages, actions suits or proceedings resulting from such failure by the *Contractor*.

Add new paragraph 10.2.8 as follows:

10.2.8 The *Contractor* shall furnish all certificates that are required or given by the appropriate governmental authorities as evidence that the *Work* as installed conforms with the laws and regulations of authorities having jurisdiction, including certificates of compliance for the *Owner's* occupancy or partial occupancy. The certificates are to be final certificates giving complete clearance of the *Work*, in the event that such governmental authorities furnish such certificates.

GC 10.4 WORKERS' COMPENSATION

10.4.1 Delete paragraph 10.4.1 and replace with the following:

Prior to commencing the *Work*, and with each and every application for payment thereafter, including the *Contractor's* application for payment of the holdback amount following *Substantial Performance of the Work* and again with the *Contractor's* application for final payment, the *Contractor* shall provide evidence of compliance with workers' compensation legislation in force at the *Place of the Work*, including payments due thereunder.

GC 11.1 INSURANCE

Delete entirety of general condition and CCDC 41 and replace with the following**:**

11.1 Without restricting the generality of GC 12 – INDEMNIFICATION, the *Contractor* shall provide, maintain, and pay for the insurance coverages specified in GC 11.1 – INSURANCE. Unless otherwise stipulated, the duration of each insurance policy shall be from the date of commencement of the *Work* until the expiration of the warranty periods set out in the *Contract Documents*. Prior to commencement of the *Work* and upon the placement, renewal, amendment, or extension of all or any part of the insurance, the *Contractor* shall promptly provide the *Owner* with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any amending endorsements.

.1 **General Liability Insurance**

General liability insurance shall be in the name of the *Contractor*, with the *Owner* and the *Consultant* named as additional insureds, with limits of not less than $5,000,000.00 inclusive per occurrence for bodily injury, death, and damage to property, including loss of use thereof, for itself and each of its employees, *Subcontractors* and/or agents. The insurance coverage shall not be less than the insurance required by IBC Form 2100, or its equivalent replacement, provided that IBC Form 2100 shall contain the latest edition of the relevant CCDC endorsement form. To achieve the desired limit, umbrella,

or excess liability insurance may be used. All liability coverage shall be maintained for completed operations hazards from the date of *Substantial Performance of the Work*, as set out in the certificate of *Substantial Performance of the Work*, on an ongoing basis for a period of 6 years following *Substantial Performance of the Work*. Where the *Contractor* maintains a single, blanket policy, the addition of the *Owner* and the *Consultant* is limited to liability arising out of the *Project* and all operations necessary or incidental thereto. The policy shall be endorsed to provide the *Owner* with not less than 30 days' notice, in writing, in advance of any cancellation and of change or amendment restricting coverage.

.2 **Automobile Liability Insurance**

Automobile liability insurance in respect of licensed vehicles shall limits of not less than $2,000,000.00 inclusive per occurrence for bodily injury, death and damage to property, covering all licensed vehicles *owned* or leased by the *Contractor*, and endorsed to provide the *Owner* with not less than 30 days' notice, in writing, in advance of any cancellation, change or amendment restricting coverage. Where the policy has been issued pursuant to a government-operated automobile insurance system, the *Contractor* shall provide the *Owner* with confirmation of automobile insurance coverage for all automobiles registered in the name of the *Contractor*.

.3 **Aircraft and Watercraft Liability Insurance [NTD: This can come out if N/A]**

Where determined necessary by the *Contractor*, acting reasonably, aircraft and watercraft liability insurance will be obtained in accordance with the provisions of paragraph 11.1.3. Aircraft and watercraft liability insurance with respect to owned or non-owed aircraft and watercraft if used directly or indirectly in the performance of the *Work*, including use of additional premises, shall be subject to limits of not less than $2,000,000.00 inclusive per occurrence for bodily injury, death and damage to property, including loss of use thereof and limits of not less than $2,000,000.00 for aircraft passenger hazard. Such insurance shall be in a form acceptable to the *Owner*. The policies shall be endorsed to provide the *Owner* with not less than 30 days' notice, in writing, in advance of cancellation, change or amendment restricting coverage.

.4 Property and Boiler and Machinery Insurance

(1) Builder's Risk property insurance shall be in the name of the *Contractor* with the *Owner* and the *Consultant* named as additional insureds. The policy shall insure against all risks of direct physical loss or damage to the property insured which shall include all property included in the *Work*, whether owned by the *Contractor* or the owner or owned by others, so long as the property forms part of the *Work*. The property insured also includes all materials and supplies necessary to complete the work, whether installed in the work temporarily or permanently, in storage on the project site, or in transit to the project site, as well as temporary buildings, scaffolding, falsework forms, hoardings, excavation, site preparation and similar work. The insurance shall be for not less than the sum of the amount of the contract price and the full value of products that are specified to be provided by the owner for incorporation into the work, if applicable, with the deductible of $10,000.00 payable by the contractor. The insurance shall include the foregoing and, otherwise, shall not be less than the insurance required by IBC Form 4042 or its equivalent replacement provided that the IBC Form 4042 shall include the latest addition of the relevant CCDC endorsement form. The coverage shall be based on a completed value form and shall be maintained continuously until ten (10) days after the date of the final certificate of payment.

(2) Boiler and machinery insurance shall be in the name of the *Contractor*, with the *Owner* and the *Consultant* named as additional insureds, for not less than the replacement value of the boilers, pressure vessels and other insurable objects forming part of the *Work*. The insurance provided shall not be less than the insurance provided by the "Comprehensive Boiler and Machinery Form" and shall be maintained continuously from commencement of use or operation of the property insured and until 10 days after the date of the final certificate for payment.

(3) The policies shall allow for partial or total use or occupancy of the *Work*.

(4) The policies shall provide that, in the case of a loss or damage, payment shall be made to the *Owner* and the *Contractor* as their respective interests may appear. The *Contractor* shall act on behalf of the *Owner* for the purpose of adjusting the amount of such loss or damage payment with the insurers. When the extent of the loss or damage is determined, the *Contractor* shall proceed to restore the *Work*. Loss or damage shall not affect the rights and obligations of either party under the *Contract* except that the *Contractor* shall be entitled to such reasonable extension of the *Contract Time*, relative to the extent of the loss or damage, as determined by the *Owner*, in its sole discretion.

(5) The *Contractor* shall be entitled to receive from the *Owner*, in addition to the amount due under the *Contract*, the amount at which the *Owner's* interest in restoration of the *Work* has been appraised, such amount to be paid as the restoration of the *Work* proceeds and as provided in GC 5.2 – APPLICATIONS FOR PROGRESS PAYMENT and GC 5.3

– PROGRESS PAYMENT. In addition, the *Contractor* shall be entitled to receive from the payments made by the insurer the amount of the *Contractor's* interest in the restoration of the *Work.*

(6) In the case of loss or damage to the *Work* arising from the work of other contractors, or the *Owner's* own forces, the *Owner*, in accordance with the *Owner's* obligations under paragraph 3.2.2.4 of GC 3.2 – CONSTRUCTION BY OWNER OR OTHER CONTRACTORS, shall pay the *Contractor* the cost of restoring the *Work* as the restoration of the *Work* proceeds and as provided in GC 5.2 – APPLICATIONS FOR PROGRESS PAYMENT and GC 5.3 – PROGRESS PAYMENT.

.5 Contractors' Equipment Insurance

"All risks" contractors' equipment insurance covering construction machinery and equipment used by the *Contractor* for the performance of the *Work*, excluding boiler insurance, shall be in a form acceptable to the *Owner* and shall not allow subrogation claims by the insurer against the *Owner.* The policies shall be endorsed to provide the *Owner* with not less than 30 days' notice, in writing, in advance of cancellation, change or amendment restricting coverage. Subject to satisfactory proof of financial capability by the *Contractor* for self-insurance of his equipment, the *Owner* agrees to waive the equipment insurance requirement.

11.1.2 The *Contractor* shall be responsible for deductible amounts under the policies except where such amounts may be excluded from the *Contractor's* responsibility by the terms of GC 9.1 - PROTECTION OF WORK AND PROPERTY and GC 9.2 - DAMAGES AND MUTUAL RESPONSIBILITY.

11.1.3 Where the full insurable value of the *Work* is substantially less than the *Contract Price*, the *Owner* may reduce the amount of insurance required to waive the course of construction insurance requirement.

11.1.4 If the *Contractor* fails to provide or maintain insurance as required by the *Contract Documents*, then the *Owner* shall have the right to provide and maintain such insurance and provide evidence of same to the *Contractor*. The *Contractor* shall pay the costs thereof to the *Owner* on demand, or the *Owner* may deduct the amount that is due or may become due to the *Contractor*.

11.1.5 All required insurance policies shall be with insurers licensed to underwrite insurance in the jurisdiction of the *Place of the Work*.

GC 11.2 CONTRACT SECURITY

11.2.2 Delete paragraph after the word "provided" and replace with the following:

Such bonds shall be issued by a duly licensed surety company, which has been approved by the *Owner*, authorized to transact a business of suretyship in the province or territory of the *Place of the Work* and shall be maintained in good standing until the fulfillment of the *Contract*, including all warranty and maintenance periods set out in the *Contract Documents.*

Add new paragraph 11.2.3 as follows:

11.2.3 It is the intention of the parties that the performance bond shall be applicable to all of the *Contractor's* obligations in the *Contract Document* and, wherever a performance bond is provided with language which conflicts with this intention, it shall be deemed to be amended to comply. The *Contractor* represents and warrants to the *Owner* that it has provided its surety with a copy of the *Contract Documents* prior to the issuance of such bonds.

GC 12.1 INDEMNIFICATION

Delete General Condition 12.1 – INDEMNIFICATION in its entirety and substitute as follows:

12.1.1 The *Contractor* shall indemnify and hold harmless the *Owner*, its parent, subsidiaries and affiliates, the *Consultant* and their respective partners, trustees, officers, directors, agents and employees from and against any and all claims, liabilities, expenses, demands, losses, damages, actions, costs, suits, or proceedings (hereinafter called "claims"), whether in respect of claims suffered by the *Owner* or in respect of claims by third parties, that directly or indirectly arise out of, or are attributable to, the acts or omissions of the *Contractor*, its employees, agents, *Subcontractors*, *Suppliers* or any other persons for whom it is in law responsible (including, without limitation, claims that directly or indirectly arise out of, or are

attributable to, loss of use or damage to the *Work*, the *Owner's* property or equipment, the *Contractor's* property or equipment or equipment or property adjacent to the *Place of the Work* or death or injury to the *Contractor's* personnel).

12.1.2 The provisions of GC 12.1 - INDEMNIFICATION shall survive the termination of the *Contract*, howsoever caused and no payment or partial payment, no issuance of a final certificate of payment and no occupancy in whole or in part of the *Work* shall constitute a waiver or release of any of the provisions of GC 12.1.

GC 12.2 WAIVER OF CLAIMS

12.2.1 In the fourth line, add the words "claims for delay pursuant to GC 6.5 DELAYS" after the word "limitation". Add the words "(collectively "Claims")" after "*Substantial Performance of the Work*" in the sixth line.

12.2.1.1 Change the word "claims" to "Claims" and change the word "claim" to "Claim".

12.2.1.2 Change the word "claims" to "Claims".

12.2.1.3 Delete paragraph in its entirety.

12.2.1.4 Change the word "claims" to "Claims".

12.2.2 Change the words "in paragraphs 12.2.1.2 and 12.2.1.3" to "in paragraph 12.2.1.2".Change the word "claims" to "Claims" in both instances and change the word "claim" to "Claim".

12.2.3 Delete paragraph in its entirety.

12.2.4 Delete paragraph in its entirety.

12.2.5 Delete paragraph in its entirety.

12.2.6 Change the word "claim" to "Claim" in all instances in the paragraph.

12.2.7 Change "The party" to "The *Contractor*. Change the word "claim" to "Claim" in all instances in the paragraph.

12.2.8 Change "under paragraphs 12.2.1 or 12.2.3" to "under paragraph 12.2.1". Change both instances of the words "the party" to "the *Contractor*". Change the word "claim" to "Claim" in all instances in the paragraph.

12.2.9 Delete paragraph 12.2.9 in its entirety.

12.2.10 Delete paragraph 12.2.10 in its entirety.

GC 12.3 WARRANTY

12.3.2 Delete from the first line of paragraph 12.3.2 the word, "The" and substitute the words "Subject to paragraph 3.4.1, the…"

Add new paragraphs 12.3.7 to 12.3.12 as follows:

12.3.7 Where required by the *Contract Documents*, the *Contractor* shall provide a maintenance bond as security for the performance of the *Contractor's* obligations as set out in GC 12.3 WARRANTY.

12.3.8 The *Contractor* shall provide fully and properly completed and signed copies of all warranties and guarantees required by the *Contract Documents*, containing:

.1 the proper name of the *Owner*;
.2 the proper name and address of the *Project*;
.3 the date the warranty commences, which shall be at the "date of *Substantial Performance of the Work*" unless otherwise agreed upon by the *Consultant* in writing.
.4 a clear definition of what is being warranted and/or guaranteed as required by the *Contract Documents*; and
.5 the signature and seal (if required by the governing law of the *Contract*) of the company issuing the warranty, countersigned by the *Contractor*.

12.3.9 Should any *Work* be repaired or replaced during the time period for which it is covered by the specified warranty, a new warranty shall be provided under the same conditions and for the same period as specified herein before. The new warranty shall commence at the completion of the repair or replacement.

12.3.10 The *Contractor* shall ensure that its *Subcontractors* are bound to the requirements of GC 12.3 – WARRANTY for the *Subcontractor's* portion of the *Work.*

12.3.11 The *Contractor* shall ensure that all warranties, guarantees or other obligations for *Work*, services or *Products* performed or supplied by any *Subcontractor, Supplier* or other person in connection with the *Work* are obtained and available for the direct benefit of the *Owner.* In the alternative, the *Contractor* shall assign to the *Owner* all warranties, guarantees or other obligations for *Work*, services or *Products* performed or supplied by any *Subcontractor, Supplier* or other person in connection with the *Work* and such assignment shall be with the consent of the assigning party, where required by law, or by the terms of that party's contract. Such assignment shall be in addition to, and shall in no way limit, the warranty rights of the *Owner* under the *Contract Documents.*

12.3.12 The *Contractor* shall commence or correct any deficiency within 2 Working Days after receiving a notice from the *Owner* or the *Consultant*, and shall complete the *Work* as expeditiously as possible, except in the case where the deficiency prevents maintaining security or where basic systems essential to the ongoing business of the *Owner* and/or its tenants cannot be maintained operational as designed. In those circumstances all necessary corrections and/or installations of temporary replacements shall be carried out immediately as an emergency service. Should the *Contractor* fail to provide this emergency service within 8 hours of a request being made during the normal business hours of the *Contractor*, the *Owner* is authorized, notwithstanding GC 3.1, to carry out all necessary repairs or replacements at the *Contractor's* expense.

PART 13 OTHER PROVISIONS

Add new Part 13 OTHER PROVISIONS as follows:

GC 13.1 OWNERSHIP OF MATERIALS

13.1.1 Unless otherwise specified, all materials existing at the *Place of the Work* at the time of execution of the *Contract* shall remain the property of the *Owner*. All *Work* and *Products* delivered to the *Place of the Work* by the *Contractor* shall be the property of the *Owner*. The *Contractor* shall remove all surplus or rejected materials as its property when notified in writing to do so by the *Consultant*.

GC 13.2 CONSTRUCTION LIENS

13.2.1 In the event that a claim for lien is registered against the *Project* by a *Subcontractor, Sub-subcontractor* or *Supplier*, and provided the *Owner* has paid all amounts properly owing under the *Contract*, the *Contractor* shall, at its own expense:

.1 within 10 calendar days, ensure that any and all claims for lien and certificates of action are discharged, released, or vacated by the posting of security or otherwise; and

.2 in the case of written notices of lien, ensure that such notices are withdrawn, in writing.

13.2.2 In the event that the *Contractor* fails to conform with the requirements of paragraph 13.2.1, the *Owner* may fulfil those requirements without *Notice in Writing* to the *Contractor* and set off and deduct from any amount owing to the *Contractor*, all costs and associated expenses, including the costs of posting security and all legal fees and disbursements associated with discharging or vacating the claim for lien or certificate of action and defending the action. If there is no amount owing by the *Owner* to the *Contractor*, then the *Contractor* shall reimburse the *Owner* for all of the said costs and associated expenses.

13.2.3 Notwithstanding any other provision in the *Contract*, the *Consultant* shall not be obligated to issue a certificate and the *Owner* shall not be obligated to make payment to the *Contractor* if, at the time such certificate or payment was otherwise due:

.1 a claim for lien has been registered against the *Project* lands, or

.2 if the *Qwner* or mortgagee of the *Project* lands has received written notice of a lien or

.3 the *Owner* or *Consultant* reasonably believe that any party has purported to retain title to *Products* or materials in respect of which an application for payment has been made.

13.2.4 Without limiting the foregoing, the *Contractor* shall, if requested by the *Owner*, defend, indemnify and save the *Owner* harmless from the amount of all such claims and the costs of defending any and all actions commenced against the *Owner* pursuant to the construction/builder's lien legislation in force at the *Place of the Work*, including the legal costs of the *Owner*, unless the lien was a direct result of a breach of the *Contract* by the *Owner* or the non-payment by the *Owner* of a valid charge or claim under the *Contract*.

13.2.5 GC 13.2 – CONSTRUCTION LIENS does not apply to construction/builder's liens claimed by the *Contractor*.

END OF AMENDMENTS TO CCDC 2 - 2008

DESIGNATED SUBSTANCES SURVEY

(per Section 30, OHSA)

ASBESTOS PRODUCTS RE-ASSESSMENT

(per Section 8, O.Reg. 278/05)

Our Lady of Fatima Catholic School

Chatham, Ontario

Prepared for:

St. Clair Catholic District School Board
245 Tecumseh Street
Sarnia, Ontario
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October 31, 2017

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TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

OH Solutions Inc. (OHS) was retained by the St. Clair Catholic District School Board to conduct a re-assessment of the condition of known friable asbestos-containing materials (ACM) and a visual inspection for mould at Our Lady of Fatima School located at 545 Baldoon Road North in Chatham, Ontario.

The school is a single storey structure, with a total area of 27,000 square feet. The original building was constructed in 1978. In addition to the investigation for asbestos and mould, the school was evaluated for the presence of any other designated substances.

Under the *Occupational Health & Safety Act* (OSHA), an owner must determine whether any Designated Substances are present at a site and is required to prepare a list of all Designated Substances that are present. These substances may require special handling procedures. The current OHSA regulation lists the following eleven (11) substances as Designated Substances in the workplace: acrylonitrile, arsenic, asbestos, benzene, coke oven emissions, ethylene oxide, isocyanates, lead, mercury, silica and vinyl chloride.

Based on the estimated construction date and the reported use of the building, the review undertaken by OHS targeted asbestos, lead, mercury, and silica which, in our experience, are most likely to be present on-site.

The following report explains our survey methodology and summarizes the hazardous building materials found at the Site.

2.0 SURVEY METHODOLOGY

During this investigation the surveyor inspected the building for construction material suspected of containing asbestos after reviewing previous reports and database information. In addition, the surveyor inspected the building for construction materials suspected of containing other Designated Substances.

Note:

- Repetitive testing was generally not performed. Items, which were visually similar to others tested, were considered to be of like material and were not sampled again. However, due to the variable nature of some products, several samples may have been collected of some materials.

- No destructive testing was performed. The inaccessible spaces within the building were not inspected. This includes areas above plaster or

drywall ceilings (in the absence of access panels) as well as shafts, chases and bulkheads. Similarly, doors, motors and other equipment were not disassembled to determine composition.

- Vinyl sheet flooring and vinyl asbestos tiles have been recorded where observed, but may not be identified where they are present beneath multiple layers of flooring.

There was no access to the roof at the time of the assessment.

2.1 Asbestos

No additional asbestos bulk samples were collected as a part of this re-assessment.

2.2 Other Hazardous Building Materials and Designated Substances

All other hazardous building materials or Designated Substances were identified based on visual assessment and historical usage.

3.0 REGULATORY REQUIREMENTS

"Designated Substance" as defined by the Ontario *Occupational Health & Safety Act* (OHSA) means "a biological, chemical or physical agent or combination thereof prescribed as a Designated Substance to which the exposure of a worker is prohibited, regulated, restricted, limited or controlled." Under Section 30 of the OHSA an owner is required to determine whether any Designated Substances are present at a project site before beginning construction. If any portion of the project is tendered, the person issuing the tenders is required to list the Designated Substances present at the project site. The constructor is then required to ensure that every contractor and sub-contractor receives a copy of the list.

Designated Substances are regulated under Ontario Regulation 490/09, which identifies the occupational exposure limits for these materials. Under Subsection 3(3) of the Regulation, construction projects are excluded from the OELs and most of the other requirements of the Regulation. For this reason, the Ministry of Labour (MOL) has issued regulations and guidelines to cover asbestos, lead and silica on construction.

Ontario Regulation 278/05 classifies all disturbance of asbestos as Type 1, Type 2 or Type 3, each of which is associated with defined work practices. All asbestos material waste is subject to special handling and disposal practices, and must be removed prior to partial or full demolition. Removal of any quantity of asbestos of more than $1m^2$ requires notification of the MOL. Disposal of asbestos waste is

subject to waste management regulations under Ontario Regulation 347/90 as amended to Ontario Regulation 102/07.

The Guidelines: “Silica on Construction Projects” and “Lead on Construction Projects” identify precautions required for various activities that may disturb silica, or lead during construction, renovation or maintenance activities.

The MOL guideline for the control of lead exposures during the removal of lead on construction projects does not include criteria for categorizing lead paint. The Ontario Ministry of Labour (MOL) does not have a standard to state what percentage of lead a material must have to be considered lead-containing. The Environmental Abatement Council of Ontario (EACO) has issued a “Lead Guideline for Construction, Renovation, Maintenance or Repair”. This guideline recommends procedures to protect against lead exposure when concentrations of lead in paint exceed 0.1% by weight, but suggests that finishes with concentrations below 0.1% by weight do not require lead specific precautions provided the material is not disturbed in an aggressive manner (e.g. grinding or sandblasting) and that general dust control is adequate.

There are currently no regulations specifically covering exposure to mould or outlining mould remediation practices. In addition, there are no occupational exposure limits stating acceptable levels of exposure without adverse health effects.

However, Sections 25 and 27 of the Ontario *Occupational Health and Safety Act* states that an employer must take every reasonable precaution to ensure the health and safety of their workers. This includes exposure to moulds.

4.0 RESULTS

4.1 Asbestos-Containing Materials

Asbestos is a general name for several varieties of highly fibrous silicate minerals. Commercially significant types of asbestos include chrysotile, amosite and crocidolite. The fibres are valued for their heat and chemical resistance properties. The combination of fibrous structures, low heat conductivity, high electrical resistance, chemical inertness, strength and flexibility, as well as its effectiveness as a reinforcing or binding agent when combined with cement and/ or plastic, made asbestos popular for widespread industrial use.

One measure of the potential hazard of ACM is its friability. The Ontario Ministry of Labour asbestos regulation defines a friable material as one when dry can be crumbled, pulverized or powdered by hand pressure. The friability of ACM is considered a significant indicator of the ease with which fibres may be released

into the air. Non-friable products with bound asbestos pose no danger of releasing airborne fibres unless cut, broken up or otherwise physically abraded.

The following is a summary of the asbestos-containing or asbestos-suspect materials that were encountered at Our Lady of Fatima School. A detailed summary of asbestos materials identified in the building are included in Appendix II.

4.1.1 Sprayed Fireproofing

No sprayed fireproofing was encountered in the survey of this facility.

4.1.2 Texture Finishes

No texture finishes was encountered in the survey of this facility.

4.1.3 Acoustic Ceiling Tiles

Asbestos-containing ceiling tiles have been removed from the building.

4.1.4 Mechanical Insulation

Asbestos and non-asbestos mechanical insulation is present in this building. Parging cement has been removed from the majority of piping systems although it is still present in the gymnasium and may be present in inaccessible areas. Non-asbestos parging cement is present in some locations. Straight run pipe insulation is generally non-asbestos fiberglass.

4.1.5 Plaster and Drywall

Plaster finishes were not encountered in the survey of this school.

Drywall joint compound was not generally sampled as a part of this re-assessment. Drywall compound used in construction prior to 1988 should be considered to be asbestos-suspect. The compound in the Resource Room at the south end of the school (Location 80) was sampled in advance of a renovation project and found to be asbestos-free.

4.1.6 Asbestos Cement Sheets

No asbestos cement or “transite” products were encountered in the re-assessment of this facility.

4.1.7 Vinyl Floor Tiles

The vinyl floor tiles in the facility have been assumed to contain asbestos. These products are non-friable, and as such are not expected to release airborne

asbestos fibre under normal conditions of building use. If a large quantity of floor tile is to be removed, it may be practical to verify the presence of asbestos at that time.

4.2 Lead

Painted finishes in the building were not sampled. Lead may be present in some finishes within the building.

4.3 Mercury

Mercury is present in thermostats and within fluorescent light tubes located within the building.

4.4 Silica

Common construction sand contains free crystalline silica and is present in concrete products, mortar, brick, etc. These construction products are typically found throughout building structures.

4.5 Acrylonitrile, Benzene, Isocyanates, Arsenic, Ethylene Oxide, Vinyl Chloride and Coke Oven Emissions

Evidence suggesting the presence of acrylonitrile, benzene, isocyanates, arsenic, ethylene oxide, vinyl chloride monomer or coke oven emissions was not observed at Our Lady of Fatima School.

4.6 Mould

In recent years, contamination of buildings with mould has become a major concern. Mould growth will occur on any water damaged building material. Evidence does exist to support the relationship between exposure to mould in buildings and many health effects.

This re-assessment included the inspection of areas for visible mould growth. In the absence of occupants experiencing symptoms, the inspection for and remediation of visible mould present in the building will be an appropriate response to the issue. Where occupants are experiencing symptoms, in the absence of visible mould growth, some invasive inspection may be necessary to find potential sources of mould. In general this was beyond the scope of this assessment.

Although some evidence of water damage was present, visible mould was not evident in the course of this inspection. Locations where water stained/damaged tiles were identified are outlined in the following table:

Location	Quantity of Water Damaged Material
LOC 29 – Meeting Room 109A	2 stained ceiling tiles
LOC 40 - Classroom	3 stained ceiling tiles
LOC 55 – Storage 142	1 stained ceiling tile
Classroom 164 – Addition	1 stained ceiling tile
Classroom 174 – Addition	1 stained ceiling tile
Classroom 125B – Addition	1 stained ceiling tile
Classroom 166B – Addition	1 stained ceiling tile
Classroom 166 – Addition	1 stained ceiling tile

5.0 RECOMMENDATIONS

The following recommendations are made with respect to the hazardous building materials and Designated Substances noted at Our Lady of Fatima School:

5.1 Asbestos

5.1.1 Asbestos Management Program

Since asbestos-containing materials were identified at this facility, the building is subject to the requirement for an Asbestos Management Program, as specified under Ontario Regulation 278/05.

5.1.2 Specific Recommendations

5.1.2.1 Mechanical Insulation

Any activity, which will disturb asbestos-containing mechanical insulation, is governed by the procedures outlined in Reg. 278/05. The disturbance of less than nine linear feet (or nine parged fittings or nine square feet of parging cement) of asbestos-containing mechanical insulation may be performed as a Type 2 operation, while any greater disturbance requires Type 3 precautions.

5.1.2.2 Drywall Joint Compound

The sampling of drywall compound was not performed throughout the school. If any disturbance of these materials is planned, sampling should be performed in advance.

Removal of more than 9 square feet, of drywall compound containing asbestos requires Type 2 procedures under Reg. 278/05.

5.1.2.3 Vinyl Floor Tiles

Vinyl floor tiles may be removed, with manually powered tools, following the Type 1 procedures outlined in Reg. 278/05. The use of powered equipment on non-friable asbestos materials, an activity which could result in the release of airborne fibre, must be performed under Type 3 precautions.

5.2 Lead

Although samples were not collected, it should be assumed that lead is present within paint finishes at the site. As a result, the handling or disturbance of painted finishes should be evaluated to help ensure that workers are not adversely affected.

The lead-containing materials in the building will not generate airborne lead dust in the absence of disturbance. However, significant lead dust levels can result when uncontrolled work procedures are used on lead-based materials. The control of dust levels during the demolition of the buildings can be accomplished through proper work practises such as wetting the surface of the materials to reduce overall dust levels and providing workers with washing facilities and proper respiratory protection.

The procedures outlined in the MOL document ‘Guideline – Lead on Construction Projects’ (2004) should provide an adequate standard for the handling or disturbance of the material.

The disposal of construction waste containing lead is controlled under Ontario Regulation 347, as amended by O. Reg. 102/07, and may be subject to Leachate Criteria (Schedule 4) of this regulation.

5.3 Mercury

The presence of mercury in fluorescent light tubes and thermostats poses minimal risk to occupants or workers provided the equipment is handled properly and the mercury is not allowed to escape. In the event of future renovations, light tubes and thermostat tubes should be removed intact to prevent the mercury vapour

from escaping.

It is good management practice to take precautions to prevent mercury vapours from becoming airborne during building demolition. Exposure to airborne mercury is regulated under Ontario Regulation 490/09 made under the *Occupational Health and Safety Act*. The current TWAEV for mercury vapour is 0.025 mg/m^3 (except alkyl compounds).

Mercury waste must be handled and disposed of according to Ontario Regulation 347, as amended by O. Reg. 102/07, and may be subject to Leachate Criteria (Schedule 4) of this regulation.

5.4 Silica

Disturbance of materials containing silica will occur during demolition of walls and ceilings, saw cutting floor slabs and removal of lay-in acoustic ceiling tiles containing silica and is regulated under Ontario Regulation 490/09. The current TWAEV for amorphous fused silica is 0.1 mg/m^3 and is 0.05 mg/m^3 for crystalline silica (quartz). This can be accomplished through proper work practises such as wetting the surface of the materials to reduce overall dust levels and providing workers with washing facilities and proper respiratory protection.

5.5 Mould

Mould growth on building materials was not observed during this investigation. At this time, no further action is required regarding conditions observed. However water damaged acoustic tiles and drywall were observed throughout the school. OHS recommends that this material be removed to reduce the potential for mould growth on the water impacted surface.

Moisture issues are the only factor in the growth of mould that may be controlled by the building operator. Any existing moisture problems in the building must be addressed to prevent or control mould growth. The following general recommendations are made to reduce the potential for future mould growth within the building:

- Promptly respond to any water infiltration, including minor leaks.
- Where HVAC units permit, maintain relative humidity below 60%.
- Maintain caulking at sinks, bathrooms and at exterior locations.

In the event of a flood, remove water by pumping or vacuuming as soon as possible. Drying of construction and finishing materials must begin promptly (in

less than 24 hours). It may be practical to remove and dispose of some wetted materials, (e.g. drywall and carpet) in some cases.

6.0 LIMITATIONS AND WARRANTY

OHS has prepared this report for the exclusive use of the Client in evaluating the Site at the time of OHS's assessment. OHS will not be responsible for the use of this report by any third party, or reliance on or any decision to be made based on it without the prior written consent of OHS. OHS accepts no responsibility for damages, if any, by any third party because of decisions or actions based on this report.

The findings and conclusions documented in this report have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by qualified professionals currently practising in this area of environmental assessment. No other warranty, expressed or implied, is made.

The findings contained in this report are based upon conditions as they were observed at the time of investigation. No assurance is made regarding changes in conditions subsequent to the time of investigation.

If new information is developed in future work, OHS should be contacted to re-evaluate the conclusions of this report and to provide amendments as required.

Respectfully submitted,

OH Solutions Inc.

Kris Olson, P.Eng.
Senior Project Manager

APPENDIX I

BULK SAMPLING RESULTS

(From Previous Assessments)

PINCHIN
Environmental

Pinchin Environmental

Asbestos Samples Report

Project #: 13256 **Client Name:** St. Clair Catholic District School Board

Building #: 31 **Building Name:** Our Lady of Fatima School Chatham **Survey Date:** 08/28/2007

Sample Number	System	Material	Location Number	Has Asbestos	Phase One		Phase Two		Description
					Asb. Type	Result	Asb. Type	Result	
0001	Piping	Parging Cement	1	√	Chrysotile	50-75%	No Result	NR	Parging cement pipe fittings
0002	Ceiling	Lay-in tiles	3		None Detected	ND	No Result	NR	Lay-in ceiling tiles
0003	Ceiling	Lay-in tiles	5		None Detected	ND	No Result	NR	Lay-in ceiling tiles
0004	Walls	Glued-on tiles	7		None Detected	ND	No Result	NR	Stuck-on ceiling tiles
0005	Ceiling	Lay-in tiles	15	√	Amosite	0.5-5%	No Result	NR	Lay-in ceiling tiles
0006	Ceiling	Lay-in tiles	80		None Detected	ND	No Result	NR	Lay-in tiles
0007	Ceiling	Lay-in tiles	80		None Detected	ND	No Result	NR	Lay-in Tiles
0008	Ceiling	Lay-in tiles	80		None Detected	ND	No Result	NR	Lay-in Tile
0009	Walls	Drywall Compound	80		None Detected	ND	No Result	NR	Drywall Joint Compound
0010	Walls	Drywall Compound	80		None Detected	ND	No Result	NR	Drywall Joint Compound
0011	Walls	Drywall Compound	80		None Detected	ND	No Result	NR	Drywall Joint Compound

APPENDIX II

UPDATED ROOM-BY-ROOM ASBESTOS MATERIALS SUMMARY

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Building Number : SC 31		**Building Name :** Our Lady of Fatima School Chat						**Survey Date :** 08/28/2017		
Level : LOC 01 - First Floor		**Room :** Boiler Room						**Asbestos Present :** Potentially		
Ceiling	Suspect Drywall Compound	400.0	SF	Good		C	8	Yes	No	
Duct	Uninsulated									
Floor	Concrete									
Mechanical	Boiler									
Piping	Fibreglass Straight Run									
Piping	Uninsulated									
Structure	Inaccessible									
Wall	Masonry									
Comments: No access above ceiling.										
Level : LOC 02 - First Floor		**Room :** Electrical Room						**Asbestos Present :** Potentially		
Ceiling	Suspect Drywall Compound	120.0	SF	Good		C	8	Yes	No	
Duct	Inaccessible									
Floor	Concrete									
Mechanical	Inaccessible									
Piping	Inaccessible									
Structure	Inaccessible									
Wall	Masonry									
Comments: No access above ceiling.										
Level : LOC 03 - First Floor		**Room :** Corridor						**Asbestos Present :** Potentially		

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Ceiling	Non-Asbestos Lay-in Tile									S0002
Duct	Uninsulated									
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	10.0	SF	Good		C	8	Yes	No	

Comments:

Level : LOC 04 - First Floor **Room :** Corridor **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									S0002
Ceiling	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	
Duct	Uninsulated									
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	25.0	SF	Good		C	8	Yes	No	

Comments:

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Level : LOC 05 - First Floor		**Room :** Side Entrance				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									S0003
Duct	Uninsulated									
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Rain Water Leader									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Suspect Drywall Compound	150.0	SF	Good		A	8	Yes	No	
Comments:										
Level : LOC 06 - First Floor		**Room :** Office				**Asbestos Present :** No				
Ceiling	Not Found									
Duct	Not Found									
Floor	Concrete									
Mechanical	Not Found									
Piping	Not Found									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Comments:										
Level : LOC 07 - First Floor		**Room :** Gymnasium				**Asbestos Present :** Yes				

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Ceiling	Non-Asbestos Lay-in Tile									
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	2,520.0	SF	Good		A	8	Yes	No	
Piping	Asbestos Parging Cement Fittings	2.0	EA	Good		C	7	Yes	Yes	V0001
Piping	Fibreglass Straight Run									
Piping	Fibreglass with PVC									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Non-Asbestos 1 x 1 Tile									S0004

Comments:

Includes corridor to left side of stage

Level : LOC 08 - First Floor **Room :** Equipment Storage Room **Asbestos Present :** Potentially

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Ceiling	Not Found									
Duct	Not Found									
Floor	Suspect Vinyl Floor Tile	100.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Piping	Non-Asbestos Parging Cement									
Structure	Concrete									
Wall	Masonry									

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Fittings in this location sampled by THEM. Non-asbestos

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Level : LOC 09 - First Floor		**Room :** Stage				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos 1 x 1 Tile									
Ceiling	Not Found									
Duct	Not Found									
Floor	Suspect Vinyl Floor Tile	480.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	100.0	%	Good		C	8	Yes	No	
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 10 - First Floor		**Room :** Equpment Storage Room				**Asbestos Present :** Potentially				
Ceiling	Not Found									
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	200.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Not Found									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Level : LOC 11 - First Floor		**Room :** Boy's Change Room				**Asbestos Present :** Potentially				
Ceiling	Suspect Drywall Compound	300.0	SF	Good		C	8	Yes	No	
Duct	Inaccessible									
Floor	Terrazzo									
Mechanical	Inaccessible									
Piping	Uninsulated									
Structure	Inaccessible									
Wall	Masonry									
Comments: No access above ceiling.										
Level : LOC 12 - First Floor		**Room :** Girl's Change Room				**Asbestos Present :** Potentially				
Ceiling	Suspect Drywall Compound	300.0	SF	Good		C	8	Yes	No	
Duct	Inaccessible									
Floor	Terrazzo									
Mechanical	Inaccessible									
Piping	Uninsulated									
Structure	Inaccessible									
Wall	Masonry									
Comments: No access above ceiling.										
Level : LOC 13 - First Floor		**Room :** Custodial Storage Room				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Ceiling	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Duct	Inaccessible									
Floor	Suspect Vinyl Floor Tile	126.0	SF	Good		A	8	Yes	No	
Mechanical	Inaccessible									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Wall	Masonry									
Wall	Suspect Drywall Compound	5.0	SF	Good		C	8	Yes	No	

Comments: No access above ceiling.
Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 14 - First Floor **Room :** 2 - Washroom **Asbestos Present :** Potentially

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Ceiling	Suspect Drywall Compound	25.0	SF	Good		C	8	Yes	No	
Duct	Inaccessible									
Floor	Suspect Vinyl Floor Tile	25.0	SF	Good		A	8	Yes	No	
Mechanical	Inaccessible									
Piping	Uninsulated									
Structure	Inaccessible									
Wall	Masonry									
Wall	Suspect Drywall Compound	5.0	SF	Good		C	8	Yes	No	

Comments: No access above ceiling.
Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 15 - First Floor **Room :** Secretary's Office **Asbestos Present :** Potentially

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Ceiling	Non-Asbestos Lay-in Tile									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Ceiling	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	
Duct	Uninsulated									
Floor	Non-Asbestos Vinyl Tile - New									
Mechanical	Not Found									
Piping	Not Found									
Structure	Steel Beam, Deck									
Wall	Masonry									
Wall	Suspect Drywall Compound	5.0	SF	Good		C	8	Yes	No	

Comments:

Level : LOC 16 - First Floor **Room :** Vestibule **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									
Duct	Not Found									
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Not Found									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	25.0	SF	Good		C	8	Yes	No	

Comments:

Level : LOC 17 - First Floor **Room :** Principal's Office **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									
Duct	Uninsulated									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Floor	Carpet									
Mechanical	Not Found									
Piping	Not Found									
Structure	Steel Beam, Deck									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments:

Level : LOC 18 - First Floor **Room :** 2 - Office **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									
Duct	Inaccessible									
Floor	Suspect Vinyl Floor Tile	180.0	SF	Good		A	8	Yes	No	
Mechanical	Inaccessible									
Piping	Fibreglass Straight Run									
Structure	Inaccessible									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments: No access above ceiling.
Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 19 - First Floor **Room :** Corridor **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									
Duct	Not Found									
Floor	Suspect Vinyl Floor Tile	80.0	SF	Good		A	8	Yes	No	

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Mechanical	Not Found									
Piping	Not Found									
Structure	Steel Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	30.0	SF	Good		C	8	Yes	No	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 20 - First Floor **Room :** Supply Room **Asbestos Present :** Potentially

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Ceiling	Non-Asbestos Lay-in Tile									
Duct	Not Found									
Floor	Suspect Vinyl Floor Tile	70.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 21 - First Floor **Room :** Washroom **Asbestos Present :** Potentially

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Ceiling	Suspect Drywall Compound	30.0	SF	Good		C	8	Yes	No	
Duct	Inaccessible									
Floor	Suspect Vinyl Floor Tile	30.0	SF	Good		A	8	Yes	No	

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Mechanical	Inaccessible									
Piping	Uninsulated									
Structure	Inaccessible									
Wall	Masonry									

Comments: No access above ceiling.
Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 22 - First Floor **Room :** Teacher's Work Room **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	170.0	SF	Good		A	8	Yes	No	
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 23 - First Floor **Room :** Staff Room **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	440.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 24 - First Floor	**Room :** Staff Washroom					**Asbestos Present :** Potentially				
Ceiling	Suspect Drywall Compound	30.0	SF	Good		C	8	Yes	No	
Duct	Inaccessible									
Floor	Suspect Vinyl Floor Tile	30.0	SF	Good		A	8	Yes	No	
Mechanical	Inaccessible									
Piping	Uninsulated									
Structure	Inaccessible									
Wall	Masonry									
Wall	Suspect Drywall Compound	3.0	SF	Good		C	8	Yes	No	
Comments: No access above ceiling. Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 25 - First Floor	**Room :** Corridor					**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments:

Level : LOC 26 - First Floor **Room :** Corridor **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	30.0	SF	Good		C	8	Yes	No	

Comments:

Level : LOC 27 - First Floor **Room :** Corridor **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	20.0	SF	Good		C	8	Yes	No	

Comments:

Includes vestibule

Level : LOC 28 - First Floor **Room :** Library **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Floor	Carpet									
Floor	Suspect Vinyl Floor Tile	200.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	150.0	SF	Good		C	8	Yes	No	

Comments:

Level : LOC 29 - First Floor **Room :** Resource Centre **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	308.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 30 - First Floor **Room :** Librarian's Office **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	144.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 31 - First Floor **Room :** Storage Room **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	168.0	SF	Good		A	8	Yes	No	

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Mechanical	Inaccessible									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Inaccessible									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments: No access above ceiling.
Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 32 - First Floor **Room :** 3 - Storage Room **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	80.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 33 - First Floor **Room :** Publishing Room **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Floor	Non-Asbestos Vinyl Tile - New									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments:

Level : LOC 34 - First Floor **Room :** Girl's Washroom **Asbestos Present :** Potentially

Ceiling	Suspect Drywall Compound	120.0	SF	Good		C	8	Yes	No	
Duct	Inaccessible									
Floor	Terrazzo									
Mechanical	Inaccessible									
Piping	Uninsulated									
Structure	Inaccessible									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments: No access above ceiling.

Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 35 - First Floor **Room :** Boy's Washroom **Asbestos Present :** Potentially

Ceiling	Suspect Drywall Compound	120.0	SF	Good		C	8	Yes	No	
Duct	Uninsulated									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Piping	Uninsulated									
Structure	Steel Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	Yes	No	

Comments:

Level : LOC 36 - First Floor **Room :** 5 - Classroom **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	784.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	30.0	SF	Good		C	8	Yes	No	

Comments: Limited access above ceiling.

Vinyl Floor Tile Assumed to Contain Asbestos

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Level : LOC 37 - First Floor		**Room :** 4 - Classroom				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	840.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 38 - First Floor		**Room :** 3 - Classroom				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	840.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 39 - First Floor		**Room :** 2 - Classroom				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	840.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 40 - First Floor		**Room :** 1 - Classroom				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	840.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 41 - First Floor		**Room :** Corridor				**Asbestos Present :** Yes				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Terrazzo									
Piping	Asbestos Parging Cement Roof Hopper	1.0	EA	Good		C	7	No	Yes	V0001
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Piping	Transite Straight Run	5.0	LF	Good		D	7	No	No	
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	50.0	SF	Good		C	8	Yes	No	
Comments:										
Level : LOC 42 - First Floor		**Room :** Corridor				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Terrazzo									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	30.0	SF	Good		C	8	Yes	No	

Comments:

Level : LOC 43 - First Floor **Room :** Corridor **Asbestos Present :** No

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Not Found									
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									

Comments:

Level : LOC 44 - First Floor **Room :** 6 - Classroom **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	784.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 45 - First Floor **Room :** 7 - Classroom **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	784.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 46 - First Floor **Room :** 8 - Classroom **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Floor	Suspect Vinyl Floor Tile	784.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 47 - First Floor **Room :** 9 - Kindergarten **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	784.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Piping	Uninsulated									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	30.0	SF	Good		C	8	No	Yes	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Level : LOC 48 - First Floor		**Room :** 9 - Kindergarten Coat Room				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	216.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Piping	Uninsulated									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 49 - First Floor		**Room :** Storage Room				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	96.0	SF	Good		A	8	Yes	No	
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 50 - First Floor **Room :** Side Entrance **Asbestos Present :** No

Ceiling	Non-Asbestos Lay-in Tile									
Duct	Not Found									
Floor	Terrazzo									
Mechanical	Not Found									
Piping	Not Found									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									

Comments:

Level : LOC 51 - First Floor **Room :** 10 - Classroom **Asbestos Present :** Potentially

Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	784.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 52 - First Floor		**Room :** 11 - Classroom				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	784.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 53 - First Floor		**Room :** 12 - Classroom				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	784.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 54 - First Floor		**Room :** Prep Room				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	215.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	
Comments: Vinyl Floor Tile Assumed to Contain Asbestos										
Level : LOC 55 - First Floor		**Room :** Storage Room				**Asbestos Present :** Potentially				
Ceiling	Non-Asbestos Lay-in Tile									V0002
Duct	Uninsulated									
Floor	Suspect Vinyl Floor Tile	80.0	SF	Good		A	8	Yes	No	
Mechanical	Not Found									
Piping	Fibreglass Fitting									
Piping	Fibreglass Straight Run									
Structure	Steel Beam, Deck & Joist									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Wall	Masonry									
Wall	Suspect Drywall Compound	15.0	SF	Good		C	8	No	Yes	

Comments: Vinyl Floor Tile Assumed to Contain Asbestos

Level : LOC 56 - First Floor **Room :** Boy's Washroom **Asbestos Present :** Potentially

Ceiling	Suspect Drywall Compound	230.0	SF	Good		C	8	Yes	No	
Duct	Uninsulated									
Floor	Terrazzo									
Mechanical	Inaccessible									
Piping	Uninsulated									
Structure	Inaccessible									
Wall	Masonry									
Wall	Suspect Drywall Compound	5.0	SF	Good		C	8	Yes	No	

Comments: No access above ceiling.

Level : LOC 57 - First Floor **Room :** Girls Washroom **Asbestos Present :** Potentially

Ceiling	Suspect Drywall Compound	230.0	SF	Good		C	8	Yes	No	
Duct	Inaccessible									
Floor	Terrazzo									
Mechanical	Inaccessible									
Piping	Uninsulated									
Structure	Inaccessible									
Wall	Masonry									

Asbestos Status Report

(sorted by Building Number)

UPPER(BUILD:BuildingNumber) = 'SC 31'

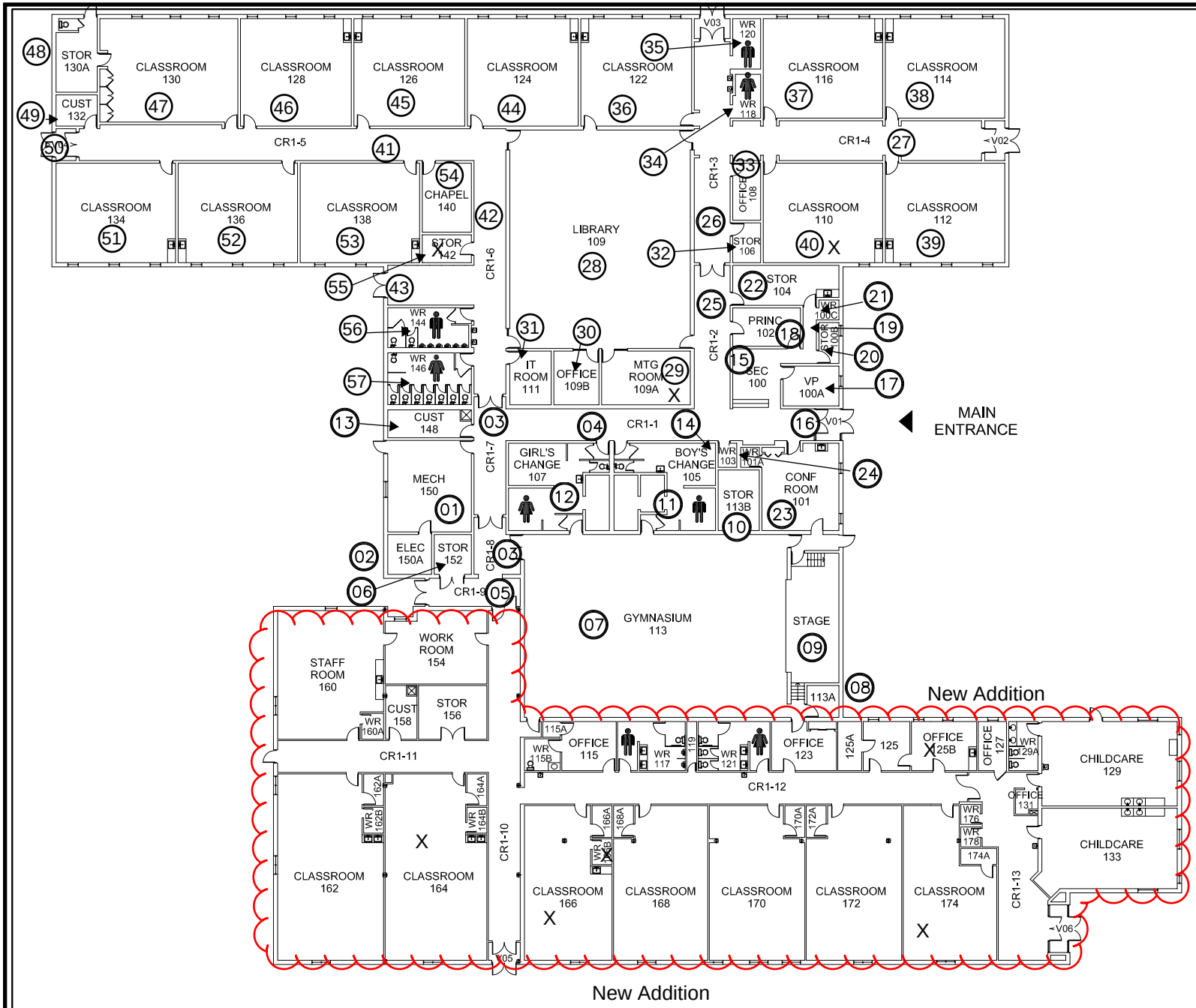
OH SOLUTIONS

Design	Description	Quantity		Cond.	Asbestos type	Access.	Action	Visible	Friable	Sample
Wall	Suspect Drywall Compound	5.0	SF	Good		C	8	Yes	No	

Comments: No access above ceiling.

APPENDIX III

DRAWINGS OUTLINING INSPECTION LOCATIONS



OH SOLUTIONS
Occupational Hygiene Solutions
119 Thames Street South
Ingersoll, Ontario
N5C 2T3

St. Clair Catholic School Board

Our Lady Of Fatima Elementary School Chatham

Main Floor
Survey Locations

Project:	Prepared by:
17-1176	JE
Scale: N.T.S.	Date: Aug 2017

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED PARKING LOT, BUS ROUTE AND PLAYGROUND AREA CONSTRUCTION
OUR LADY OF FATIMA SCHOOL
CHATHAM, ONTARIO

Submitted to:

St. Clair Catholic District School Board
c/o ROA Studio Inc.
67 King Street West
Chatham, Ontario
N7M 1C7
Attn: Mr. Joseph Ouellette

Submitted by:

Amec Foster Wheeler Environment and Infrastructure
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16 June 2017

SWW177161

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TABLE OF CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited ("Amec Foster Wheeler") was retained by the St. Clair Catholic District School Board ("SSCDSB") c/o ROA Studio Inc. (the "Client") to conduct a geotechnical investigation for the proposed playground addition, parking lot and bus route reconstruction for Our Lady of Fatima School located at 545 Baldoon Road, in Chatham, Ontario (the "Site").

The project areas are shown on the Key Plan, Figure 1. The purpose of this investigation was to provide subsurface soil information, and based on this information, to provide geotechnical recommendations pertaining to the construction of the pavement structure for the parking lot, bus route and playground area, as well as provide preliminary bearing capacities and depths of foundations for a potential building addition, should one be proposed.

The scope of the fieldwork for this geotechnical investigation included the advancement of one (1) borehole within the existing parking lot, one (1) borehole within the existing bus route, one (1) borehole for the proposed new parking lot and one (1) borehole within the existing playground area. The boreholes were advanced to a depth of 5.0 metres (m) below the existing ground surface.

This report contains the findings of Amec Foster Wheeler's geotechnical investigation, together with recommendations and comments. The recommendations and comments are based on factual information and intended only for use by design engineers. The number of boreholes may not be sufficient to determine all of the factors that may affect construction methods and costs. Subsurface and groundwater conditions between and beyond the boreholes may differ from those encountered at the borehole locations, and conditions may become apparent during construction that could not be detected or anticipated at the time of the site investigation.

The anticipated construction conditions are also discussed, but only to the extent that they may influence the design decisions. The feasible construction methods; however, express our opinion and are not intended to direct contractors on how they carry out construction. Contractors should also be aware that the data and their interpretation presented in this report may not be sufficient to assess all factors that may have effect upon construction.

This report has been prepared with the assumption that the design will be in accordance with good engineering practices, applicable regulations of jurisdictional authorities, and applicable standards and regulations. Further, the recommendations and opinions in this report are applicable only to the proposed project. Environmental considerations were not included in the scope of work. The limitations of this report, as discussed in detail in Appendix "A", constitute an integral part of this report.

There should be an ongoing liaison with Amec Foster Wheeler during both the design and construction phases of this project to ensure that the recommendations in this report have been interpreted and implemented. Also, should any further clarification and/or elaboration be needed concerning the geotechnical aspects of this project, Amec Foster Wheeler should be contacted immediately.

2.0 SITE DESCRIPTION AND GEOLOGICAL BACKGROUND

2.1 Site Description

The Site is located at 545 Baldoon Road in Chatham, Ontario, as shown on Figure 1. The Site is located in a residential and agricultural area of Chatham. The general topography of the site was flat.

The boreholes were advanced at the approximate locations, as indicated in our proposal PSWW177109 dated February 16, 2017, within the existing parking lot, the existing bus route, the proposed new parking lot and the new playground area, where underground utilities allowed.

2.2 Geologic Background

The Site is located within a mapped area of coarse glaciolacustrine deposits, underlain by shale bedrock at a depth of approximately 30 m to 40 m (Ontario Geological Survey, Preliminary Map P. 3255, 1994).

3.0 INVESTIGATIVE PROGRAM

3.1 Field Work

The scope of the geotechnical fieldwork included four (4) sampled boreholes designated as BH1 to BH4, inclusive, in the parking lot, bus route and playground area. The boreholes were advanced to depths of 5.0 m below the existing ground surface. The locations and depths of the boreholes were determined by Amec Foster Wheeler based on the requirements from the Client.

The locations of the boreholes from the current geotechnical investigation are shown on Figure 2. The coordinates of the boreholes are shown on the Record of Borehole sheets attached in Appendix B. The coordinates at the borehole locations were recorded in the field using a hand-held GPS device with a horizontal accuracy of 3.0 m.

The borehole drilling program for the investigation was carried out on May 1, 2017. The boreholes were advanced using a self-propelled drill equipped with hollow stem augers and conventional soil sampling tools. Soil samples were taken at frequent intervals of depth following the Standard Penetration Test (ASTM D-1586) procedure.

The drilling was conducted under the full-time supervision of Amec Foster Wheeler's engineering staff who directed the drilling and sampling operation, and logged the boreholes.

After completion of the borehole, the augers were extracted, the borehole was inspected for groundwater and caving, then backfilled using bentonite hole plug and temporary asphalt patching, if necessary.

All samples were field logged, placed in airtight containers, and transported to Amec Foster Wheeler's Tecumseh laboratory for further examination and testing.

Ground surface elevations at the borehole locations were referenced to a local datum, with a given elevation of 100.000 m, described as:

The top nut of the fire hydrant adjacent to the west corner of the Site building.

The elevations used in this report were obtained strictly for use by this office in the geotechnical design of the project. They should not be used by any other party for any other purpose.

3.2 Laboratory Testing

Natural moisture content tests were carried out in accordance with ASTM D2216 on all recovered soil samples. One grain size distribution was completed on a sample from BH4 in accordance with ASTM D7928. The test results are included in Appendix C.

4.0 SUBSURFACE CONDITIONS

4.1 Subsurface Soil Conditions

The results of laboratory testing carried out on select samples are also shown on the Record of Borehole sheets in Appendix B. The results of the grain size analysis can be found in Appendix C. The following is a brief description of the soil conditions encountered, presented as a summary only.

Topsoil

Topsoil was encountered in BH1 from ground surface to a depth of approximately 200 millimetres (mm).

Pavement Structure - Asphalt and Granular Materials

Three boreholes, BH2, BH3 and BH4, were drilled within the existing asphalt located on the north, west and south sides of the existing building and encountered a surface layer of asphalt overlying a layer of granular fill. The existing thicknesses of asphalt, granular fill and sand fill materials encountered at the borehole locations are tabulated below:

Table 1: – Existing Pavement and Fill

Borehole No.	Pavement Structure	
	Asphalt Thickness (mm)	Granular Fill Thickness (mm)
BH2	50	175
BH3	75	430
BH4	100	200

Fill Materials

Fine sand fill was encountered in boreholes BH2 and BH4 below the granular fill to depths of 460 mm and 965 mm, respectively.

Silty clay fill was encountered below the topsoil in BH1 and below the granular fill in BH3. The silty clay fil was encountered to a depth of 1.4 m at both locations. The measured “N” values from the Standard Penetration Tests obtained in the silty clay fill were 11 blows per 0.3 m. The moisture content ranged from 20% to 22%.

Native Soils

Underlying the fill materials was a deposit of a wide range of soils, ranging from silty sand to silty clay. Silty clay was encountered directly below the sand fill in BH2 to a depth of 1.4 m. The

measured “N” values from the Standard Penetration Tests obtained were 13 blows per 0.3 m, indicating a stiff consistency. The moisture content of this sample was 2%.

Silty sand was encountered below the fill in BH1 and the silty clay in BH2 to depths of 2.1 m. The measured “N” values from the Standard Penetration Tests obtained ranged from 9 to 13 blows per 0.3 m, indicating a compact consistency. The moisture contents ranged from 21% to 25%.

Sandy silt was encountered below the silty sand in BH2, and below the fill in boreholes BH3 and BH4. The measured “N” values from the Standard Penetration Tests obtained ranged from 13 to 28 blows per 0.3 m, indicating a compact consistency. The moisture contents ranged from 18% to 25%.

Brown silty clay was encountered in BH1 at a depth ranging from 2.1 m to 3.3 m and a measured “N” values from the Standard Penetration Tests obtained of 9 blows per 0.3 m, indicating a firm consistency. The moisture contents ranged from 26% to 32%.

Grey silty clay till was encountered to the termination of each borehole. The measured “N” values from the Standard Penetration Tests obtained ranged from weight of hammer to 5 blows per 0.3 m, indicating a very soft to soft consistency. The moisture contents ranged from 24% to 30%. Vane shear testing was conducted in the grey silty clay till in BH4 at a depth of 5.3 m and indicated the silty clay had an undrained shear strength of 21 kPa, and a remoulded shear strength of 7 kPa.

Geotechnical Laboratory Testing

One grain size distribution analysis was carried out on Sample 2 from BH4. The results of the test are included on the borehole log sheet and attached in Appendix C.

Table 2: Results of Grain Size Analysis

Borehole No. / Sample No.	Sample Depth (metres)	Grain Size Distribution			
		Gravel (%)	Sand (%)	Silt (%)	Clay (%)
B4/Sa 2	1.5 – 2.0	0.0	1.2	84.3	14.5

4.2 Groundwater

Groundwater level observations and measurements in the boreholes, and in-situ moisture contents of recovered soil samples are presented on the Record of Borehole sheets.

Groundwater was encountered in boreholes BH2, BH3 and BH4. Groundwater was measured at depths of 4.0 m and 4.6 m in BH3 and BH4, respectively. Borehole BH2 was found to cave in at 1.7 m below ground surface, consistent with the depth of the silty sand encountered at that location.

Typically, the 'grey zone' is indicative of a permanent saturated condition, and therefore, fluctuation of the long-term groundwater should be anticipated near this depth. The anticipated long-term groundwater should be expected to be between El. 96.0 m and El. 97.2 m. However, during and after local precipitation events, groundwater that is 'perched' above the long-term levels may accumulate in the fills and weathered mottled/brown silty clays, as well as the silty sand and sandy silt stratigraphic layers above the relatively more impervious grey silty clay. In addition, significant amounts of groundwater may be present within the layers/pockets of granular soils known to occur randomly within the overburden soils and within any fill materials around the existing utilities that may be present.

Perched groundwater may rise to the ground surface following precipitation and snowmelt. In the absence of an active, engineered drainage system, the design should assume possible temporary groundwater levels rising to the ground surface.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 General

Amec Foster Wheeler understands the Client is planning a full reconstruction of the parking lot, bus route and playground area. After the completion of the field investigation and during the preparation of the report, Amec Foster Wheeler was notified that a building addition without basement may be constructed at the Site. The Client has requested preliminary Serviceability Limit State (SLS) and Ultimate Limit State (ULS) bearing capacities to be included in the report. The boreholes were all advanced to a depth of 5.0 m below ground surface.

5.2 Soil Types

The soils encountered in this investigation below the existing pavement material and fill was native undisturbed sandy silt and silty clay to the full extent of drilling.

5.3 Shallow Foundations

At the time of the writing of this report, no indication was given to Amec Foster Wheeler that a building addition was to be constructed. The SLS and ULS bearing capacities given are intended as preliminary calculations and can be further refined if an additional field investigation is carried out and design parameters for a new building addition are provided to Amec Foster Wheeler.

The foundations of the potential building addition should not be placed on the existing fill material surrounding the building. Strip or square footings should be placed at 1.4 m below ground surface, or about El. 97.8 m and may be designed using a geotechnical reaction at SLS of 40 kPa for 25 mm of settlement and a factored geotechnical resistance at ULS of 60 kPa for footings founded on the compact native silty sand and sandy silt.

Typical footing dimensions for these applications include should have a maximum dimension of less than 1.5 m. The serviceability limit state is based on maximum total and minimum differential settlement tolerances of 25 mm and 20 mm, respectively. Differential settlement should be expected between the new addition and existing building sections and adequate settlement control/mitigation measures should be included in the building design.

The geotechnical pressure values listed above are for vertical loads (no inclination) and no eccentricity. The ULS values could be significantly less than stated if inclined or eccentric loading conditions exist. The foundation design must also consider load inclinations and eccentricity as per the applicable principles presented in the 2006 Canadian Foundation Engineering Manual (CFEM). Amec Foster Wheeler would be pleased to provide detailed assistance in the required geotechnical calculations to satisfy these requirements.

Exterior footings and footings in unheated areas should be provided with a minimum of 1.2 m of soil cover or equivalent thermal insulation for adequate frost protection. Should new foundations be constructed next to the existing building foundations, they should be founded at the same elevation as the existing foundations. Footings founded at different elevations should be stepped in accordance with the 2012 Ontario Building Code (2012 OBC) and at a slope not steeper than 2 horizontal to 1 vertical.

The footing excavation should be reviewed by a qualified geotechnical consultant to confirm that the bearing soil has adequate bearing capacity.

Loose or disturbed material should be removed from the footing excavation prior to the placement of concrete. Hand cleaning may be required to prepare an acceptable bearing surface. The footing subgrade should be protected at all times from rain, snow, freezing temperatures and the ingress of free water. Concrete should not be placed on frozen soil, nor should the soil beneath the footing be allowed to freeze after construction of the footing.

5.4 Shallow Mat Foundation on Native Soils

If the shallow foundations are not practical for design purposes, a raft foundation may be used and will bear on the native materials. The raft foundation may be designed using a geotechnical reaction at ULS of 75 kPa and a factored geotechnical resistance at SLS of 50 kPa. The total long-term settlement for the structure would be about 50 mm while differential settlement would be about 20 mm.

The raft foundation should be founded at 1.4 m below ground surface, or at El. 97.8 m. The depth of the raft foundation should not be below 1.7 m in order to be above the groundwater table.

The silty sand or sandy silt subgrade soil should be proof rolled without the use of vibration and inspected by a geotechnical consultant prior to the placement of concrete.

5.5 Comments on Foundation Options

If higher bearing capacities are required, consideration should be given to deepen the boreholes to provide refined recommendations for shallow and deep foundation options. Considering the limited field investigation, the Site appears to be suitable for ground improvement techniques such as geo - concrete columns with the tip placed below the very soft soils encountered. Also, helical piles are used on Sites similar to this one, where very soft soil conditions are encountered and where light to moderate loads are required. As noted, additional field work is required to expand on any of the foundation options noted above.

5.6 Seismic Conditions

The 2012 OBC contains updated seismic analysis and design methodology. The 2012 OBC uses a site classification system defined by the average soil/bedrock properties in the top 30 metres (100 feet) of the subsurface profile beneath the structure. Based on the limited site investigation and our experience in the area, a “Site Class E – Soft Soil” designation could be used for design in accordance with the 2012 OBC methodology (Table 4.1.8.4.A). Seismic field testing (geophysical testing) is recommended to confirm the seismic site classification. The four values of the Spectral response acceleration S_a (T) for different periods and the Peak Ground Acceleration (PGA) can be obtained from 2012 OBC. The design values of F_A and F_V for the project site should be calculated in accordance to 2012 OBC.

5.7 Frost Design Considerations

In accordance with the Ontario Provisional Standard Drawing (OPSD 3090.101) the design frost depth below the ground surface for the general area is estimated to be 1.2 m. Therefore, a permanent soil cover of 1.2 m or equivalent thermal insulation is required for frost protection of shallow foundations.

Where provision of the minimum depths of soil cover outlined above is not practical, rigid high density extruded polystyrene insulation could be used to reduce the required thickness of soil cover. Amec Foster Wheeler can provide recommended insulation details for specific development conditions upon request.

5.8 Backfill Requirements

The footings may be backfilled with select free-draining granular material meeting the gradation requirements of OPSS Granular 'A' or Granular 'B', Type I. The granular fill should be placed in loose lifts not exceeding 200 mm in thickness and should be uniformly compacted to 95% of Standard Proctor Maximum Dry Density (SPMDD).

The use of the existing silty clay fill as backfill is not recommended for the footings due to the fine grained nature of the material and the low permeability nature of it. The existing fill had elevated moisture contents which may also impede compaction. The silty clay fill material excavated may be used in landscaping areas where compaction specifications are not necessary.

5.9 General Recommendations for Excavations

Excavations with conventional equipment and open cut methods are feasible in these soils. Excavations must be carried out in accordance with Ontario Regulation 213 / 91 of the Occupational Health and Safety Act (OHSA). These regulations designate four broad classifications of soils to stipulate appropriate measures for excavation safety. The silty clay fill and silty sand above the recommended footing design elevation can be classified as Type 3 soils. However, unprotected slopes exposed to elements will degrade with time. If the groundwater table is found to be at an elevation higher than the design elevation, or if the excavation is advanced deeper than the groundwater table, the sandy silt may be saturated, and would be classified as Type 4 soils. Excavations within and Type 3 soils may be carried out with unsupported side-slopes not steeper than 1V:1H. Type 4 soils requires slopes at 3H:1V, or flatter, or engineered temporary shoring.

5.10 Groundwater Control

Groundwater inflow into the excavations should be minimal as the recommended footing design elevation is above the anticipated groundwater levels; however, significant 'perched' groundwater may be present within the fill materials, utility trenches and abandoned utilities. This would especially be true during and after local precipitation events. In this case, the inflow into excavations may become significant.

The soils identified are sensitive to disturbance by water. Groundwater and surface water run-off should be removed from excavations by means of pumping from strategically placed open sumps located within the excavation bottom but outside the zone of influence of any foundations.

5.11 Pavement Design

Based on the subsurface conditions encountered at the borehole locations and the laboratory testing, the following pavement design is recommended as a minimum for use at this Site:

Table 4: Minimum Recommended Pavement Thickness

Layer	Material	Recommended Minimum Thickness Parking Areas (mm)	Recommended Minimum Thickness Playground Areas (mm)	Recommended Minimum Thickness Bus Drop Off Route Access Routes and Entrances (mm)
Asphaltic Concrete	HL 3 Surface Course (OPSS 1150)	40	40	40
	HL 4 Binder Course (OPSS 1150)	50	50	75
Granular Base	Granular 'A' (OPSS 1010)	300	300	450
Granular Subbase	Granular 'B' Type I (OPSS 1010)	300	300	300

The subgrade material should be sloped so as to promote drainage and prevent the build-up and stagnation of pore water within the granular base. The Contractor should conduct non-vibratory proof-rolling of the subgrade soils, which should be inspected by a geotechnical consultant prior to the placement of the granular base. Any soft spots noted during the proof-roll should be sub-excavated and replaced with approved granular backfill such as Granular 'B' Type I or Type II (OPSS 1010).

The base layer should be hydraulically connected to catch basins, using filtered subdrains.

All granular materials should be compacted to 100% of the SPMDD. The asphalt base course and surface course should be compacted to 92% to 96.5% of their respective Maximum Relative Densities (MRD) obtained from the mix design.

If the construction is not carried out during dry weather conditions, it may be necessary to increase the recommended thicknesses of the pavement structure. Further, the granular thickness may not be sufficient to support construction traffic prior to the asphaltic concrete placement, and additional granular material may be required to support this traffic.

5.12 Drainage

To meet the design requirements for the pavement life, the pavement structure should be well drained at all times. This can be accomplished by installing 150 mm diameter full-length perforated subdrain pipes and connected to the existing catch basins, below the granular base level, to ensure effective drainage in accordance with OPSD 216.021. The subdrain pipes should be surrounded by a minimum drainage zone of 20 mm size clear stone of minimum 150 mm thickness and wrapped in suitable non-woven geotextile to provide separation from the surrounding soil.

A minimum slope of 2% should be maintained across the surface of paved sections to ensure proper surface drainage.

5.13 Pavement Construction Considerations

Fill and organic materials should be removed to expose the native sandy silt and sandy silt subgrade material, which should be immediately inspected by the Geotechnical Consultant. Any soft spots noted should be sub-excavated and replaced with approved granular backfill such as Granular 'B' Type I or Type II (OPSS 1010). Alternatively to subexcavation of soft/loose areas, a biaxial geogrid similar to Terrafix 2500 placed over a non-woven geotextile similar to Terrafix 270R can be used to reinforce the subgrade.

The Contractor should conduct non-vibratory proof-rolling of the subgrade soils. Any soft or loose spots revealed by the proof-rolling should be sub-excavated and replaced with approved granular backfill Granular 'B' Type I or Type II (OPSS 1010). Where new fill is needed to raise the grade, or replace disturbed portions of the subgrade, imported granular fill conforming to the gradation requirements of OPSS Granular 'B' Type I (OPSS 1010) should be placed in maximum 300 mm thick lifts and compacted to at least 98% of SPMDD. The long term performance of the pavement structure is dependent upon the sub-grade support conditions. Stringent construction control procedures must be maintained to ensure that uniform subgrade moisture and density conditions are achieved as much as practically possible where fill is placed and that the subgrade is not disturbed or weakened after it is exposed.

Following the stripping of the existing asphalt, the existing granular material may be suitable for reuse at the Site. A representative sample should be collected and tested during construction to determine if the material meets OPSS 1010.

Control of surface water is a significant factor in achieving good pavement life. Grading adjacent to pavement area must be designed so that water is not allowed to pond adjacent to the outside edges of the pavement or curb.

The subgrade soils identified in this report are sensitive to disturbance from exposure to weathering and/or construction traffic (vehicular and pedestrian). Once the excavations have been completed to design elevations, the Geotechnical Consultant should immediately inspect the subgrade soils. Upon approval, the subgrade soil should be protected from further exposure. Disturbance by weathering or construction traffic may compromise the soils and necessitate further excavation.

If construction is to be completed during the winter months additional care should be given to protecting any subgrade from freezing. No backfill materials shall be placed on frozen subgrade and all backfill shall be free of frozen materials.

6.0 CLOSURE

The limitations of this report, as discussed in detail in Appendix "A", constitute an integral part of this report. We recommend the Geotechnical Consultant be retained to review drawings and the intended methods of construction prior to implementation in order to assure conformance with the geotechnical restrictions and assumptions.

We trust this report is complete within the terms of our reference. However, should questions arise concerning this report, do not hesitate to contact us.

Sincerely,
Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

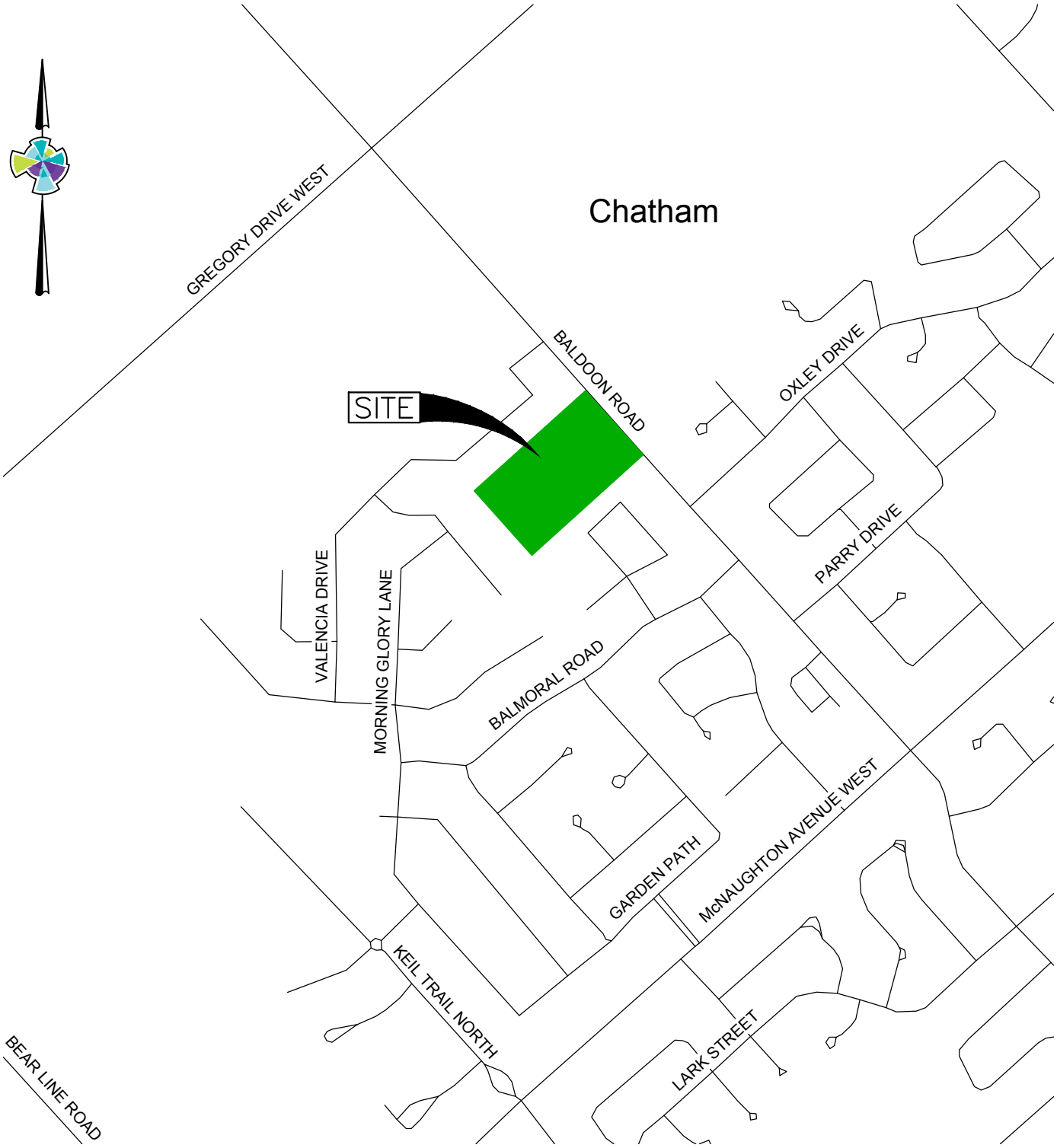
Prepared By:

Anthony Pusic, EIT,
Geotechnical EIT

Reviewed By:

Mauro Cortes, P. Eng.
Senior Geotechnical Engineer

FIGURES



NOTES:
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE REPORT No. SWW177161. ALL LOCATIONS ARE APPROXIMATE.

ORIGINAL PAPER SIZE: 8½ x 11.

REFERENCES:
CANMAP STREETFILES V2008.4.

CLIENT: ST. CLAIR CATHOLIC DISTRICT SCHOOL BOARD c/o ROA STUDIO INC. 67 KING STREET WEST CHATHAM, ONTARIO, N7M 1C7	TITLE: KEY PLAN	PROJECT: GEOTECHNICAL INVESTIGATION PROPOSED PARKING LOT, BUS ROUTE AND PLAYGROUND AREA CONSTRUCTION OUR LADY OF FATIMA SCHOOL CHATHAM, ONTARIO

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Environment & Infrastructure
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N8N 2M1
519-735-2499

DATUM: NAD83	PROJECTION: UTM Zone 17	DATE: MAY 8, 2017
DWN BY: BM	REV. No: 0	PROJECT No: SWW177161
CHK'D BY: AP	SCALE: 1:10000	FIGURE No: 1

0 10 50 100m

SCALE 1:2500

LEGEND:

APPROX. SITE BOUNDARY

BOREHOLE LOCATION

NOTES:
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE REPORT No. SWW177161.

ALL LOCATIONS ARE APPROXIMATE.

ORIGINAL PAPER SIZE: 8½ x 11.

REFERENCES:
2010 AERIAL PHOTOGRAPHS BY CHATHAM-KENT;
CANMAP STREETFILES V2008.4.

CLIENT:
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DWN BY: BM
CHK'D BY: AP
DATUM: NAD83
PROJECTION: UTM Zone 17
SCALE: 1:2500

PROJECT:
GEOTECHNICAL INVESTIGATION
PROPOSED PARKING LOT, BUS ROUTE AND
PLAYGROUND AREA CONSTRUCTION
OUR LADY OF FATIMA SCHOOL
CHATHAM, ONTARIO

TITLE:
BOREHOLE LOCATION PLAN

DATE: MAY 8, 2017
PROJECT No: SWW177161
REV. No: 0
FIGURE No: 2

APPENDIX A

REPORT LIMITATIONS

REPORT LIMITATIONS

The conclusions and recommendations given in this report are based on information determined at the testhole locations. The information contained herein in no way reflects on the environmental aspects of the Project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the testholes may differ from those encountered at the testhole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. It is recommended practice that the Geotechnical Engineer be retained during the construction to confirm that the subsurface conditions across the site do not deviate materially from those encountered in the testholes.

The design recommendations given in this report are applicable only to the project described in the text, and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known, we recommend that we be retained during the final design stage to verify that the design is consistent with our recommendations, and that assumptions made in our analysis are valid.

The comments made in this report relating to potential construction problems and possible methods of construction are intended only for the guidance of the designer. The number of testholes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work. This work has been undertaken in accordance with normally accepted geotechnical engineering practices. No other warranty is expressed or implied.

The benchmark and elevations mentioned in this report were obtained strictly for use by this office in the geotechnical design of the project, and should not be used by any other party for any other purpose.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Amec Foster Wheeler Environment & Infrastructure accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

APPENDIX B

EXPLANATION OF RECORD OF BOREHOLE SHEETS AND RECORD OF BOREHOLE SHEETS BH1 to BH4

GENERAL REPORT NOTES

DEFINITIONS OF PENETRATION RESISTANCE

Standard penetration resistance 'N' – The number of blows required to advance a standard split spoon sampler 30 cm into the subsoil, driven by means of a 63.5 kg hammer falling freely a distance of 76 cm.

Dynamic penetration resistance – The number of blows required to advance a 50 mm, 60 degree cone, fitted to the end of drill rods, 30 cm into the subsoil, the driving energy being 474.5 Joules per blow.

SAMPLE TYPE ABBREVIATIONS USED IN BOREHOLE LOGS

S.S.	Split spoon	T.W.	Thinwall open	R.C.	Rock core
A.U.	Auger sample	T.P.	Thinwall piston	W.S.	Washed sample
P.H.	Sample pushed hydraulically			P.M.	Sample pushed manually

SOIL TEST SYMBOLS USED IN BOREHOLE LOGS

○	Standard penetration resistance	▼	Laboratory Vane	□	Unconfined compression
●	Dynamic penetration resistance	▲	Field Vane	■	Undrained shear strength
		X	Penetrometer	S	Sensitivity

NOTE

The soil conditions, profiles, comments, conclusions and recommendations found in this report are based upon the samples recovered during the fieldwork. Soils are heterogeneous materials and, consequently, variations (possibly extreme) may be encountered at site locations away from boreholes. During construction, competent, qualified inspection personnel should verify that no significant variations exist from the conditions described in this report.

EXPLANATION OF BOREHOLE LOG

This form describes some of the information provided on the borehole logs, which is based primarily on examination of the recovered samples, and the results of the field and laboratory tests. Additional description of the soil/rock encountered is given in the accompanying geotechnical report.

GENERAL INFORMATION

Project details, borehole number, location coordinates and type of drilling equipment used are given at the top of the borehole log.

SOIL LITHOLOGY

Elevation and Depth

This column gives the elevation and depth of inferred geologic layers. The elevation is referred to the datum shown in the Description column.

Lithology Plot

This column presents a graphic depiction of the soil and rock stratigraphy encountered within the borehole.

Description

This column gives a description of the soil stratums, based on visual and tactile examination of the samples augmented with field and laboratory test results. Each stratum is described according to the *Modified Unified Soil Classification System*.

The compactness condition of cohesionless soils (SPT) and the consistency of cohesive soils (undrained shear strength) are defined as follows *(Ref. Canadian Foundation Engineering Manual)*:

Compactness of Cohesionless Soils	SPT N-Value
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	> 50

Consistency of Cohesive Soils	Undrained Shear Strength kPa	Undrained Shear Strength psf
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1000
Stiff	50 to 100	1000 to 2000
Very stiff	100 to 200	2000 to 4000
Hard	Over 200	Over 4000

Soil Sampling

Sample types are abbreviated as follows:

SS	Split Spoon	TW	Thin Wall Open (Pushed)	RC	Rock Core	GS	Grab Sample
AU	Auger Sample	TP	Thin Wall Piston (Pushed)	WS	Washed Sample	AR	Air Return Sample

Additional information provided in this section includes sample numbering, sample recovery and numerical testing results.

Field and Laboratory Testing

Results of field testing (e.g., SPT, pocket penetrometer, and vane testing) and laboratory testing (e.g., natural moisture content, and limits) executed on the recovered samples are plotted in this section.

Instrumentation Installation

Instrumentation installations (monitoring wells, piezometers, inclinometers, etc.) are plotted in this section. Water levels, if measured during fieldwork, are also plotted. These water levels may or may not be representative of the static groundwater level depending on the nature of soil stratum where the piezometer tips are located, the time elapsed from installation to reading and other applicable factors.

Comments

This column is used to describe non-standard situations or notes of interest.

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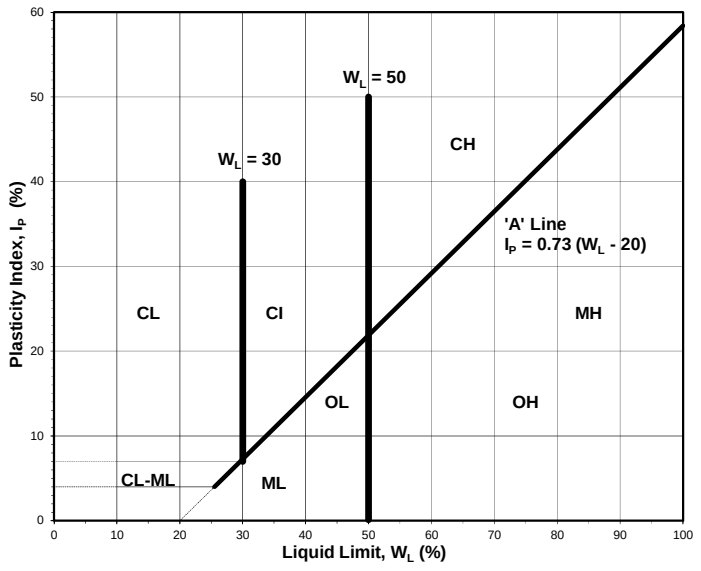
MODIFIED * UNIFIED CLASSIFICATION SYSTEM FOR SOILS

*The soil of each stratum is described using the Unified Soil Classification System (Technical Memorandum 36-357 prepared by Waterways Experiment Station, Vicksburg, Mississippi, Corps of Engineers, U.S Army. Vol. 1 March 1953.) modified slightly so that an inorganic clay of "medium plasticity" is recognized.

MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA
COARSE GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN 75µm)	GRAVELS MORE THAN HALF THE COARSE FRACTION LARGER THAN 4.75mm	CLEAN GRAVELS (TRACE OR NO FINES)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 4$; $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1$ to 3
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		DIRTY GRAVELS (WITH SOME OR MORE FINES)	GM	SILTY GRAVELS, GRAVEL-SAND- SILT MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR P.I MORE THAN 4
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR P.I MORE THAN 7
	SANDS MORE THAN HALF THE COARSE FRACTION SMALLER THAN 4.75mm	CLEAN SANDS (TRACE OR NO FINES)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_u = \frac{D_{60}}{D_{10}} > 6$; $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1$ to 3
			SP	POORLY GRADED GRAVELS, GRAVEL- SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		DIRTY SANDS (WITH SOME OR MORE FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR P.I MORE THAN 4
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR P.I MORE THAN 7
FINE-GRAINED SOILS (MORE THAN HALF BY WEIGHT SMALLER THAN 75µm)	SILTS BELOW "A" LINE NEGLIGIBLE ORGANIC CONTENT	W_L < 50%	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	CLASSIFICATION IS BASED UPON PLASTICITY CHART (SEE BELOW)
		W_L < 50%	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS	
	CLAYS ABOVE "A" LINE NEGLIGIBLE ORGANIC CONTENT	W_L < 30%	CL	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY OR SILTY CLAYS, LEAN CLAYS	
		30% < W_L < 50%	CI	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS	
		W_L < 50%	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	ORGANIC SLITS & CLAYS BELOW "A" LINE	W_L < 50%	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	WHENEVER THE NATURE OF THE FINES CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER "F", E.G SF IS A MIXTURE OF SAND WITH SILT OR CLAY
		W_L < 50%	OH	ORGANIC CLAYS OF HIGH PLASTICITY	
HIGH ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOUR OR ODOUR, AND OFTEN FIBROUS TEXTURE

SOIL COMPONENTS					
FRACTION	U.S STANDARD SIEVE SIZE		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS		
GRAVEL	COARSE	PASSING	RETAINED	PERCENT	DESCRIPTOR
		76 mm	19 mm	35-50	AND
				20-35	Y/EY
	FINE	19 mm	4.75 mm	10-20	SOME
				1-10	TRACE
SAND	COARSE	4.75 mm	2.00 mm		
	MEDIUM	2.00 mm	425 µm		
	FINE	425 µm	75 µm		
FINES (SILT OR CLAY BASED ON PLASTICITY)		75 µm			
OVERSIZED MATERIAL					
ROUNDED OR SUBROUNDED: COBBLES 76 mm TO 200 mm BOULDERS > 200 mm				NOT ROUNDED: ROCK FRAGMENTS > 76 mm ROCKS > 0.76 CUBIC METRE IN VOLUME	

Plasticity Chart for Soil Passing 425 Micron Sieve



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Note 1: Soils are classified and described according to their engineering properties and behaviour.

Note 2: The modifying adjectives used to define the actual or estimated percentage range by weight of minor components are consistent with the Canadian Foundation Engineering Manual (4th Edition, Canadian Geotechnical Society, 2006.)

RECORD OF BOREHOLE No. BH1

Project Number: **SWW177161**
Project Client: **St. Clair Catholic District School Board**
Project Name: **Our Lady of Fatima School**
Project Location: **Chatham, Ontario**
Drilling Location: **N4696051, E399498**

Drilling Method: **180 mm O.D. Hollow Stem Augers**
Drilling Machine: **CME 55**
Date Started: **01 May 2017** Date Completed: **01 May 2017**
Logged by: **SS** Compiled by: **SS**
Reviewed by: **SM** Revision No.: **0**

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LITHOLOGY PROFILE		SOIL SAMPLING						FIELD TESTING	LAB TESTING		COMMENTS & GRAIN SIZE DISTRIBUTION (%)
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 99.3 m	Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	PenetrationTesting: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	Atterberg Limits W_P W W_L; Plastic Liquid; ✳ Passing 75 um (%); ○ Moisture Content (%); ★ Unit Weight (KN/m3); 20 40 60 80	INSTRUMENTATION INSTALLATION	GR SA SI CL
	TOPSOIL (200 mm thick) 99.1										
	FILL 0.2 Silty clay, some sand, trace gravel Grey										
		SS	1	54	11	1	98	○	21		
	97.9										
	SILTY SAND 1.4 Some clay, trace gravel Brown										
		SS	2	83	9	2	97	○	21		
	97.1										
	SILTY CLAY 2.1 Some sand, trace gravel Brown Stiff										
		SS	3	89	9	3	96	○	26		
	Grey Firm	SS	4a b	100	5			○	33 24		
	Soft					4	95				
		SS	5	100	2			○	30		
		SS	6	100	2	5	94	○	26		
	94.2										
	END OF BOREHOLE 5.0 (no refusal)					6	93				
						7	92				

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▽ No freestanding groundwater observed in open borehole upon completion of drilling.

RECORD OF BOREHOLE No. BH2

Project Number: **SWW177161**
Project Client: **St. Clair Catholic District School Board**
Project Name: **Our Lady of Fatima School**
Project Location: **Chatham, Ontario**
Drilling Location: **N4696097, E399346**

Drilling Method: **180 mm O.D. Hollow Stem Augers**
Drilling Machine: **CME 55**
Date Started: **01 May 2017** Date Completed: **01 May 2017**
Logged by: **SS** Compiled by: **SS**
Reviewed by: **SM** Revision No.: **0**

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LITHOLOGY PROFILE			SOIL SAMPLING						FIELD TESTING	LAB TESTING		
Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 99.3 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	PenetrationTesting: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	Atterberg Limits W_P W W_L; Plastic Liquid; ✳ Passing 75 um (%); ○ Moisture Content (%); ★ Unit Weight (KN/m3); 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	ASPHALT (50 mm thick)	99.3 0.1										
	FILL Coarse sand, some gravel Grey	99.0 0.3										
	FILL Fine sand Brown	98.6										
	SILTY CLAY Some sand, trace gravel Mottled brown and grey Firm	0.7 97.9	SS	1	50	7	1	99 98	○	23		
	SILTY SAND Brown Compact	1.4 97.2	SS	2	72	13	2		○	25		
	SANDY SILT Grey	2.1 96.4	SS	3	100	28	3	97	○	19		
	SILTY CLAY Some sand, trace gravel Grey Very soft	2.9 94.3	SS	4	100	2	4	96	○	28		
			SS	5	100	2	5	95	○	30		
			SS	6	100	1	6	94	○	29		
	END OF BOREHOLE (no refusal)	5.0					7	93 92				

Amec Foster Wheeler
Environment & Infrastructure
1373 Confederation St.
Sarnia, ON N7S 5P1
Tel: 519-735-2499
Fax: 519-735-9669
www.amecfw.com

▽ Groundwater measured at a depth of 1.7 m upon completion of drilling.

RECORD OF BOREHOLE No. BH3

Project Number: **SWW177161**
Project Client: **St. Clair Catholic District School Board**
Project Name: **Our Lady of Fatima School**
Project Location: **Chatham, Ontario**
Drilling Location: **N4696046, E399619**

Drilling Method: **180 mm O.D. Hollow Stem Augers**
Drilling Machine: **CME 55**
Date Started: **01 May 2017** Date Completed: **01 May 2017**
Logged by: **SS** Compiled by: **SS**
Reviewed by: **SM** Revision No.: **0**

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Lithology Plot	DESCRIPTION (Local Ground Surface Elevation: 99.1 m)		Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	FIELD TESTING	LAB TESTING	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%)
	ASPHALT (76 mm thick)	99.1										
	FILL Silty clay, some sand, some gravel Grey	0.1 98.6										
	FILL Silty clay, some sand, trace gravel Mottled brown and grey	0.5	SS	1	83	11	1	98		22		
		97.8										
	SANDY SILT Some clay Mottled brown and grey Compact	1.4	SS	2	83	15	2	97		24		
	Grey		SS	3	89	14				25		
		96.2					3	96				
	SILTY CLAY Some sand, trace gravel Grey Soft	2.9	SS	4	100	3				29		
	Very soft		SS	5	100	2	4	95		26		
			SS	6	100	1	5	94		30		
		94.1										
	END OF BOREHOLE (no refusal)	5.0					6	93				
							7	92				

FIELD TESTING: Penetration Testing — SPT, DCPT; MTO Vane* — Intact, Remould; Nilcon Vane* — Intact, Remould; Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80

LAB TESTING: Atterberg Limits W_P W W_L — Plastic — Liquid; Passing 75 um (%); Moisture Content (%); Unit Weight (KN/m3); 20 40 60 80

COMMENTS & GRAIN SIZE DISTRIBUTION (%): GR SA SI CL

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▽ No freestanding groundwater observed in open borehole upon completion of drilling. ▪ Cave in measured at a depth of 4.0 m upon completion of drilling.

RECORD OF BOREHOLE No. BH4

Project Number: **SWW177161**
Project Client: **St. Clair Catholic District School Board**
Project Name: **Our Lady of Fatima School**
Project Location: **Chatham, Ontario**
Drilling Location: **N4695993, E399574**

Drilling Method: **180 mm O.D. Hollow Stem Augers**
Drilling Machine: **CME 55**
Date Started: **01 May 2017** Date Completed: **01 May 2017**
Logged by: **SS** Compiled by: **SS**
Reviewed by: **SM** Revision No.: **0**

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Lithology Plot	DESCRIPTION Local Ground Surface Elevation: 99.1 m		Sample Type	Sample Number	Recovery (%)	SPT 'N' Value	DEPTH (m)	ELEVATION (m)	FIELD TESTING Penetration Testing: ○ SPT ● DCPT; MTO Vane* △ Intact ▲ Remould; Nilcon Vane* ◇ Intact ◆ Remould; ■ Undrained Shear Strength (kPa) (from P. Penetrometer tests) 20 40 60 80	LAB TESTING Atterberg Limits W_P W W_L Plastic Liquid; ✳ Passing 75 um (%); ○ Moisture Content (%); ★ Unit Weight (KN/m3) 20 40 60 80	INSTRUMENTATION INSTALLATION	COMMENTS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	ASPHALT (100 mm thick)	99.0										
	FILL Coarse sand, some gravel	0.1 98.8										
	FILL Fine sand Brown	0.3										
		98.1	SS	1	83	11	1	98		24		
	SANDY SILT Some clay Mottled brown and grey Compact	1.1										
			SS	2	78	13				23		
	Grey						2	97				
			SS	3	72	17				18		
		96.2										
	SILTY CLAY Some sand, trace gravel Grey Soft	2.9					3	96				
			SS	4	100	3				27		
	Very soft		SS	5	50	WOH	4	95		28		
			SS	6	50	WOH				30		
							5	94				
		93.6	VT						21			
	END OF BOREHOLE (no refusal)	5.5					6	93				
							7	92				

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▽ No freestanding groundwater observed in open borehole upon completion of drilling. ■ Cave in measured at a depth of 4.6 m upon completion of drilling.

APPENDIX C

GEOTECHNICAL LABORATORY TEST RESULTS

Amec Foster Wheeler Environment & Infrastructure
11865 County Road 42
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Fax +1 (519) 735-9669
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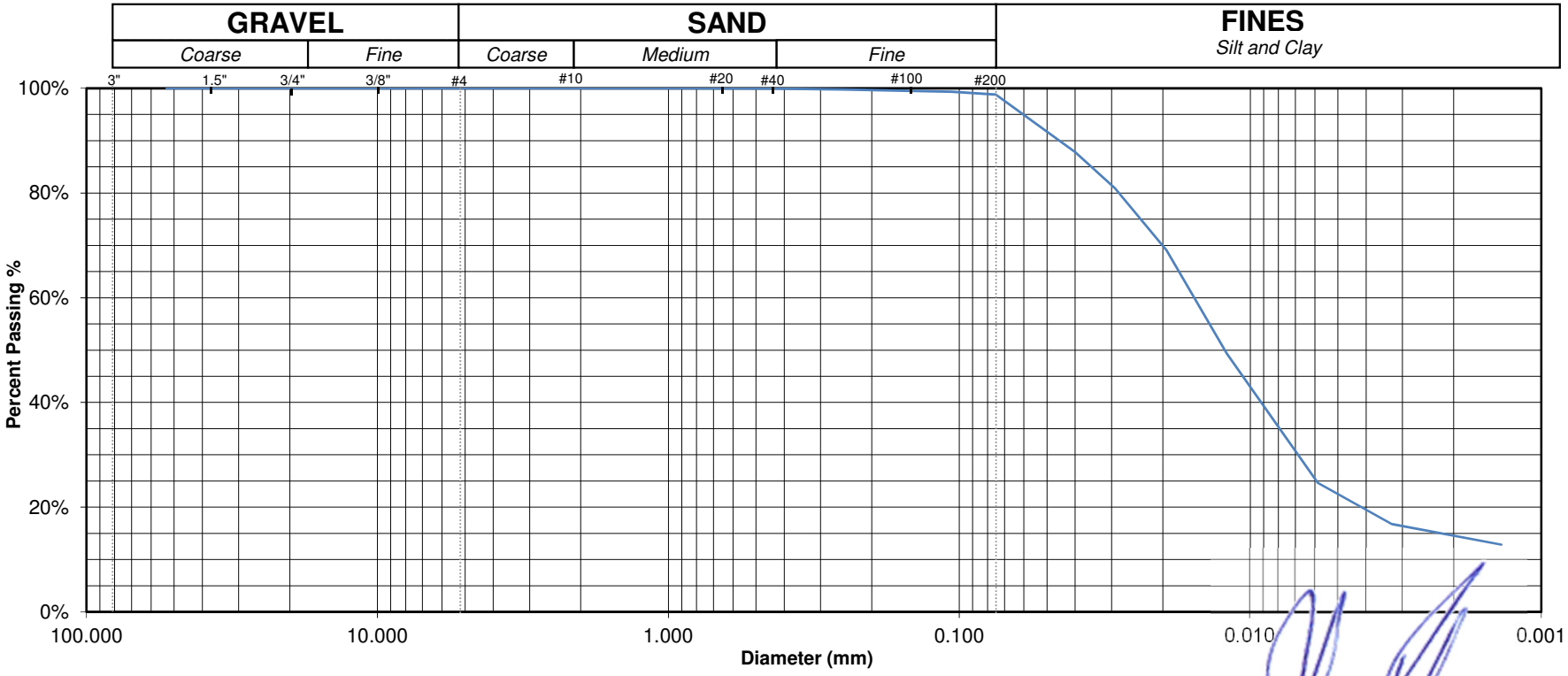
GRAIN SIZE DISTRIBUTION
MTO LS 702 / ASTM D7928 / ASTM D6913

Project Number:	SWW177161	**Sampled on:**	1-May-2017	**Sampled by:**	SS
Project Client:	Joseph Ouellette	**Received on:**	1-May-2017	**Received by:**	JP
Project Name:	Our Lady of Fatima School	**Tested on:**	5-May-2017	**Tested by:**	JP
Project Location:	545 Baldoon Road Chatham On.				

Test Results

Sample Location: **BH4, Sa. 2**
Sample Identification: **202**

Gravel	Sand	Silt	Clay	Soil Classification
	1.2%	84.3%	14.5%	SILT, some clay, trace sand



Signed by: _____
Justin Palmer, Lab Supervisor, C. Tech.

PART 1 – GENERAL

1.1. General Requirements

1.1.1. Hoarding and Protection due to Excavation, included in this Section

1.2. Shop Drawings

1.2.1. Indicate & describe in detail complete perimeter hoarding and side walk protection. Include all means of access/vehicular entrances.

1.2.2. Provide Shop Drawings to and obtain from, approval from both the Consultant and the authorities having jurisdiction. Make all revisions as required by these authorities at no additional cost to the Owner.

1.3. Permits and Fees

1.3.1. Apply for, obtain and pay for all necessary permits required by authorities having jurisdiction for the Work of this Section.

1.4. By-laws

1.4.1. Comply with the By-laws of the City of Sarnia, and all others having jurisdiction over the Work of this Section including the Occupational Health and Safety Act and Regulations for Construction Projects

PART 2 – PRODUCTS

2.1. Materials – For Internal Barriers

2.1.1. Plywood 13 mm minimum thickness Douglas Fir exterior grade plywood "B" or better for paint finish.

2.1.2. Structural Lumber: Rafters, posts, planking and bracing, N.L.G.A. No. 2 grade minimum.

2.1.3. Waterproof Membrane: "Bituthene" Regular by W.R. Grace Materials Ltd., or approved alternative.

2.1.4. Exterior alkyd paint to approved manufacturer.

2.1.5. Interior fire retardant paint to approved manufacturer.

2.1.6. Steel Studs: 0.55 mm thick, wipe coated galvanized, having knurled flanges 32 mm wide with edges doubled back at least 4.8 mm, with girts as required.

2.1.7. Gypsum Board: To meet specified requirements of CAN/CSA-A82.27-M91; **fire rated board classified for hazard by ULC and labelled as such.**

2.2. Chain-Link Fencing: For Exterior Site Enclosures

2.2.1. Galvanized Link Fabric: 50mm mesh, No. 9 gauge woven steel wire, zinc coated after weaving, to meet specified requirements of ASTM A392.

2.2.2. Tube: 90mm diameter for end posts, 45mm for top rail, 60mm for line posts, standard, butt welded steel, galvanized, Schedule 40, to meet specified requirements of ASTM A120. Hollow metal structural steel tubing with minimum wall thickness of 0.100" and meeting specified requirements of CSA G40.21, Grade 50W.

2.2.3. Tension Wire: No. 6 gauge single strand, finished to match fabric.

2.2.4. Fabric Bands: Galvanized steel to fit tubing.

2.2.5. Rail Fittings: Galvanized steel for caps, top tails guides.

2.2.6. Galvanizing: Galvanize fittings, accessories and steel tube by hot dip method after fabrication to meet specified requirements of CSA Standard G164.

2.2.7. Approved manufacturers: Frost Fencing, Lundy Steel Fencing, Donald Greening or other approved alternate. Materials need not be new however, they must be able to remain in place and perform as required for the duration of the Project.

2.2.8. Fence height: 1830mm high unless noted otherwise.

2.2.9. **Commercially available temporary construction fencing may be approved at the discretion of the architect.**

PART 3 – EXECUTION

3.1. Fabrication and Installation

3.1.1. **Hoarding**

3.1.1.1. Install hoarding, fencing and sidewalk protection to the exterior of the building in accordance with approved Shop Drawings and By-laws of the City of Sarnia, and in accordance with documents.
3.1.1.2. Provide posts, planking and plywood.
3.1.1.3. Provide pedestrian and vehicular entrances as required, complete with swing or sliding gates, screened openings and all necessary hardware including locks.
3.1.1.4. Paint complete hoarding in colour selected by Consultant.
3.1.1.5. Maintain hoarding in good condition at all times.
3.1.1.6. Repair any hoarding removed or damaged, to satisfaction of the Consultant and authorities.
3.1.1.7. Wash all hoarding at least every two months.
3.1.1.8. Remove hoarding and fencing from site only when authorized by the Consultant.

3.1.2. Barrier

3.1.2.1. Install barriers within the existing building to separate a work area from the remainder of the building.
3.1.2.2. Barriers shall be erected such that it is self-supporting and braced on work area side.
3.1.2.3. Erect a barrier of one hour fire rated drywall construction and to meet the requirements of Section 09250 and ULC Design No.W408 or W409
3.1.2.4. Barriers shall not allow for the passage of airborne dust.
3.1.2.5. Maintain minimum clearance for exits and access to exits.
3.1.2.6. Relocate, temporarily any existing life safety devices which may

become hidden or obscure due to the erection of barrier.

3.1.2.7. Maintain barriers in good stable condition at all times.

3.1.3. **Chain Link Fencing**

3.1.3.1. Posts shall be spaced at 3000mm on centre maximum and shall be driven into the ground a minimum of 1200mm deep.

3.1.3.2. Install at 40mm above grade, a single strand of tension wire with turnbuckles at each end.

3.1.3.3. Install at top of fabric, a 45mm diameter top rail with appropriate caps and holders.

3.1.3.4. Install fabric under tension under anchor to the posts, top rail and bottom tension wire at 450mm on centre.

3.1.3.5. At end post, attach fabric and 6mm x 19mm tension bands at 300mm on centre.

3.1.3.6. Provide a 45mm diameter brace between end posts at mid height.

3.1.3.7. At completion of project, completely remove temporary fencing and patch all disturbed areas to match existing.

3.1.3.8. All fencing and components will remain the property of the Contractor.

3.2. Exception

3.2.1. Temporary/movable perimeter fencing barriers for site work is may be approved by the consultant where construction activities require staged construction perimeters.

3.2.2. Where permanent hoarding is not specifically indicated, provide safety fencing at perimeter of property adjacent of streets and adjacent residential properties, separating public access areas from the work site, where no other barrier is present.

End of Section

PART 1 – GENERAL

1.1. General

1.1.1. The Contractor is fully responsible for continuous examination and inspection of the Work related to the exterior assemblies to ensure compliance with the Contract Documents.

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

1.1.3. In addition to Consultant site review, the Owner may provide quality control inspection and testing as specified.

1.1.4. Allow sufficient time for testing, evaluation, alterations and retesting so as not to affect the Progress Schedule for the Work.

1.1.5. The Consultant or Owner's inspection and testing agency may require testing of connections and special prefabricated inserts, as part of the work of this Section.

PART 2 – DESIGN AND PERFORMANCE

2.1. Design and Performance

2.1.1. Building envelope includes, but is not limited to, slabs-on-grade, foundation walls, cladding systems, glazing systems, louvres, doors, frames, mechanical and electrical penetrations of assemblies, sealants, air and vapour barrier materials, roofing and waterproofing.

2.1.2. Design and engineer as required by applicable Section of the Specifications, fabricate, erect or install building envelope in compliance with the Ontario Building Code, other regulations and requirements of authorities having jurisdiction, with the stringent requirements to govern.

2.1.3. Take into account tolerance limitations of the structure, creep, deflection and other movements of the structure, both during the Work and in service.

2.1.4. Allow for expansion and contraction of components caused by ambient, temperature range and surface temperature variation of components, and structural movements, without causing distortion, failure of fastening, joints and/or air/vapour barrier seals, undue stress or other defects detrimental to appearance and/or performance.

2.1.5. Accommodate, by means of expansion and contraction provisions, any movements in the building assemblies themselves and between the assemblies and the building structure, caused by structural movements, both deflection and racking; and/or thermal expansion and contraction, without distortion, damage, misalignment of joints, breakage of air/vapour barriers, water and air penetration through the assembly, or glass breakage.

2.1.6. Method of attachment to the structure shall take into account site peculiarities such that there shall be no possibility of site and air vibrations or normal temperature

movements of the building to loosen, weaken and/or fracture the connection between building envelope assembly components and the structure or between the components themselves.

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

2.1.8. Assemble and secure assemblies in manner which will keep stresses on sealants within the sealant manufacturers' recommended maximum.

2.1.9. Construct building envelope wall and window assemblies based on "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 structure shall have:

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

2.1.9.2. Air barriers and seals as 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 design pressures.

2.1.9.3. Such provisions in the form of openings between cavities and the building exterior of sufficient cross sections to provide adequate pressure equalization. Openings shall be effectively baffled against direct rain water entry.

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

2.1.10. Comply with the design and performance requirements specified in the Ontario Building Code, with the most stringent requirements to govern, and as specified herein, including the following principles:

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

2.1.10.2. Design, fabricate and install the assembly to minimize specified materials' ability to transmit moisture through capillary action.

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

2.1.11. The requirements for an air barrier and a vapour barrier are intended to be provided at 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 passage of moisture laden air and the diffusion of water vapour through it".

2.1.12. Design sealant joints with strict regard for sizing of joint and parallel orientation of contract surfaces. Ensure support for both sealant and backer rod.

2.1.13. This project incorporates the design principles of positive air and vapour leakage control at the building enclosure line. Drawing details illustrate continuity of air/vapour barrier penetrating elements such as door, window and louver frames.

2.1.14. The barrier extends nominally from foundation line, vertically along exterior walls and to positive contract with roof air/vapour barrier.

2.1.15. In order to maintain the continuity of the envelope, the interfacing of various building elements requires close coordination by all trades involved with the exterior building elements. The positive mechanical connections and seal of transition medium extending from the primary wall air/vapour barrier tot eh insulation line of window or door frame, shall be made with proper construction sequencing established by Contractor to ensure such interfacing. All such transition installation shall be inspected by Consultant prior to concealing with subsequent construction.

2.1.16. Manufacturers of such window or door frames shall ensure that correctly designed and positioned metallic legs, extensions or recesses are provided at the thermal break line to facilitate connections of rigid or flexible transition medium as indicated prior to setting such elements in their allotted openings.

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

2.1.18. Design building envelope assemblies to prevent damage due to earthquake forces as required by the Ontario Building Code.

End of Section

PART 1 - GENERAL

1.1. Related Sections

1.1.1. Comply with Division One as applicable.

1.1.2. Restrictions on noise, dust, interference, obstructions, access, and hours of work as described in the Instructions to Bidders and General Conditions.

1.1.3. Temporary facilities, public safety, weather and dust barriers or partitions: General Instructions, and Section 01530.

1.1.4. Work described in Division 15000 and 16000.

1.1.5. The requirements of this Section apply to all other Sections of the specifications.

1.2. References

1.2.1. CSA S350 M1980, Code of Practice of Safety in Demolition of Structures.

1.3. Existing Conditions

1.3.1. Examine areas to be selectively demolished or dismantled, and confirm that their condition is substantially the same as the date on which bids closed, and as indicated in the Contract Documents. Advise the Consultant of any conditions that vary from this.

1.3.2. Be familiar with structural system of the building, and the elements being demolished or dismantled. Ensure that all temporary measures of support are implemented in areas of demolition and reconstruction as noted on drawings.

1.3.3. Inspect site and verify with Consultant items designated for removal and items to remain. Protect existing items designated to remain and materials designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Consultant and at no cost to Owner.

1.3.4. Demolition of spray or trowel applied asbestos can be hazardous to health. Should material resembling spray or trowel applied asbestos be encountered in the course of demolition work stop work and notify the Consultant immediately. Do not proceed until written instructions have been received from the Consultant.

1.3.5. Demolition of applied asbestos materials can be hazardous to health. Should material resembling asbestos be encountered in the course of demolition work, stop work and notify the Consultant immediately. Do not proceed until written instructions have been received from the Consultant.

1.4. Extent of Demolition

1.4.1. Drawings showing extent of selective demolition are intended to be schematic and do not indicate full extent of all selective demolition work. Examine all Documents to determine complete scope of selective demolition, removals and re-instatement, repair and make good required to complete the Work.

Protection

1.4.2. Prevent movement, settlement or damage of existing structures, services, walks, paving, trees, landscaping, adjacent grades and parts of existing building to remain.

1.4.3. Provide bracing, shoring and underpinning as required. Make good damage caused by demolition.

1.4.4. Take precautions to support affected structures and, if safety of building being demolished appears to be endangered, cease operations and notify Consultant.

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

1.4.6. Provide bracing, shoring, or needling as required to support portions of existing structure or building to remain, where demolition or dismantling, cutting out, or partial removal of any elements, as specified in other Sections degrades the structural integrity of the structure to a point where it will not support all imposed loads. All bracing, shoring, and needling shall be designed to cause no damage to existing surfaces upon which the bracing, shoring or needling bears.

1.4.7. Shoring, bracing, or needling of structural items shall be designed by a Professional Engineer registered in the Province of Ontario, and drawings shall bear the seal of this Engineer. Submit drawings of shoring, bracing, or needling to the Consultant prior to installing.

1.4.8. Maintain temporary supports in place until permanent structure is able to fully support all imposed loads.

1.4.9. Make good damage to existing elements to remain caused by demolition.

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

1.4.11. Protect salvaged elements from damage. Provide protective coverings and storage.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.1. Work

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

3.1.2. Remove materials and equipment as indicated in the documents. Salvage, and store, protect, and reinstall to suit execution of other parts of the Work as indicated in the documents.

3.1.3. Items for Demolition: Refer to drawings for specific details.

3.1.3.1. Portions of existing VCT.
3.1.3.2. Door and window openings in walls, overhead lintels, portions of masonry walls.
3.1.3.3. Miscellaneous plumbing, mechanical and electrical items.
3.1.3.4. Windows as indicated.
3.1.3.5. Ceiling systems as indicated.
3.1.3.6. All other elements required to allow the Work to be completed, whether specifically indicated, or not.

3.1.4. Carefully dismantle items containing materials for salvage and stockpile salvaged materials on site at locations as indicated or as directed by Consultant.

3.1.5. Temporarily reroute service lines entering building or on the building in accordance with authorities having jurisdiction, and to suit the Work of this Contract. Post warning signs on electrical lines and equipment that must remain energized during period of work.

3.1.6. Do not disrupt active or energized utilities designated to remain undisturbed without Consultant's consent.

3.1.7. Reference the demolition of specific Mechanical and Electrical as documented in drawings and Specifications.

3.2. Safety Code

3.2.1. Comply with all applicable legislation.

3.3. Dismantling and Demolition

3.3.1. Do all work in a manner to prevent endangering safety of building assemblies, systems or occupants.

3.3.2. Selectively dismantle parts of the building as required to suit installation of new work and remedial work. Salvage and reinstall elements unless otherwise indicated. Make good disturbed surfaces.

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

3.3.4. Do not disturb adjacent items designated to remain in place.

3.3.5. 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.

3.3.6. Demolish to minimize dusting. Keep materials wetted as directed by Consultant.

3.3.7. Do not throw or allow debris to fall uncontrolled from heights. Use chutes and other controls.

3.4. Restoration

3.4.1. Upon completion of work, remove debris, trim surfaces and leave work site clean.

3.4.2. Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

End of Section

PART 1: GENERAL

1.1. General Requirements

1.1.1. Conform to requirements specified under Division 1.

1.2. Scope of the Work

1.2.1. **Work Included**

1.2.1.1. Provide all plant, labour, equipment and materials to carry out the work of this section. The work includes, but is not limited to, the following:

- Grubbing, stripping and stockpiling of topsoil
- Excavation and disposal
- Backfill and compaction
- Rough grading to make ready for application of topsoil for seed or sod
- Removal and disposal of existing foundations
- Dewatering

1.2.2. **Related Work Specified Elsewhere**

Cast-in-Place Concrete - Division 3
Excavations and Backfill for Mechanical & Electrical Services - Division 15 & 16.
Asphalt, curbs - Division 2
Site Services - Division 2
Finish Grading and Landscaping - Division 2

1.3. Applicable Standards

1.3.1. Ontario Building Code

1.3.2. The Construction Safety Act, local by-laws and all other regulations of the Ontario Ministry of Labour relating to the work of this Section.

1.3.3. OPSS Forms 1010, and 1010, Material Specification for Aggregates-General and Granular A, B, M, and Select respectively.

1.4. Sub-Surface Conditions

1.4.1. Sub-surface investigations were carried out by Amec Foster Wheeler Ltd. (Chatham Office) dated June, 2017.

1.4.2. A copy of their report is appended within this specification.

1.4.3. The information given in these reports was obtained for the use of the Owner in the execution of the design. It is presented in good faith to assist the Contractor. No guarantee is made or implied as to its detailed accuracy for every site location. It is incumbent upon the Contractor to make any additional tests to obtain any additional information deemed necessary for the proper execution of the work, at no additional cost to the Owner.

1.5. Drawings

1.5.1. Examine the drawings forming a part of this Contract and conform to the requirements of all such drawings.

1.6. Coordination and Cooperation

1.6.1. Co-ordinate the work of this Section with the work of all other Sections in accordance with the General Conditions.

1.6.2. Co-ordination and co-operation is particularly important with Landscaping, Asphalt Paving, Cast-in-Place Concrete, and excavation for Mechanical Electrical trades.

1.7. Examination

1.7.1. Examine the site for the purpose of determining the conditions prevailing there, which may affect the work of this Section, including available access to the site, existing contours, existing services, etc.

1.7.2. Determine the nature and locations of all existing services below and above ground, which may affect the work of this Section.

1.8. Special Conditions

1.8.1. The Contractors attention is drawn to existing grade elevations in the vicinity of the new building. After removal of topsoil, soft spots, and otherwise unsuitable material the Contractor must manage existing site excavated materials, and imported materials, to bring grades up to finished elevations shown Architectural and/or Site Service drawings.

1.9. Prices

1.9.1. **Unit Prices**

1.9.1.1. Provide unit prices for items listed in tender form
1.9.1.2. Include all costs as outlined in Division 1
1.9.1.3. Additional payment will not be made for accidental over-excavation by the Contractor.

PART 2: PRODUCTS

2.1. Materials

2.1.1. **Granular Fills - Class 'A' and Class 'B':**

2.1.1.1. Imported in accordance with current OPSS Form 1010, with the added requirement that material to be deposited within the building must be clean with no asphalt or other contaminates on or mixed with the soil.

2.1.2. **Granular Fill - Class PR:**

2.1.2.1. Imported, well-graded, compactable stony pit-run granular material with a maximum 8% silt fraction as approved by the soils consultant.

2.1.3. **Crushed Stone:**

2.1.3.1. Clean, screened crushed stone, well graded in size between 10mm and 25mm, with sufficient angular particles rather than round, to ensure proper compaction.

2.1.4. **Approved Site Excavated Materials:**

2.1.4.1. Site excavated lower level till material for use as general construction backfill on the exterior of the building. (Note that the moisture content and compactability of this material may have to be adjusted by drying out the material and /or mixing with other material prior to its use as backfill.)

2.1.4.2. Granular materials shall be free draining and not susceptible to frost action as determined by current M.T.C. Standards. All granular materials to be used within the building shall also be free of asphalt or other contaminates on or mixed with the soil

2.1.4.3. Submit representative samples of each class of proposed material to the Geotechnical Inspection Company for testing and approval for use on this project. Mark samples as to source of supply, including pit locations.

2.1.4.4. Supply only those materials approved for use on this project by the Inspection Company.

2.1.5. **Lean Concrete Fill**

2.1.5.1. 15 MPa with 125mm slump

2.1.6. **Weeping Tile:** – 100mm diameter perforated Big-O, or approved equal.

2.1.7. **Geotextile Fabric:** - Terrafix 270R or equal.

2.2. Fabrication

2.2.1. Mixing, transportation, placing, curing, and protection of concrete in accordance with Division 3

2.3. Source Quality Control

2.3.1. All materials shall be subject to test and inspection by a Testing and Inspection Company appointed by the Owner.

2.3.2. Cost of testing will be paid by the Owner.

2.3.3. Provide access to pits or quarries for the personnel of the Inspection Company.

2.3.4. Provide representative samples of materials as may be required by the Inspection Company at no additional cost to the Owner.

PART 3: EXECUTION

3.1. Grubbing and Clearing

3.1.1. Grub and clear the site of trees, shrubs, existing foundations to be removed, debris and obstructions, unless clearly noted elsewhere to be retained.

3.1.2. Remove and dispose of all material listed in items A. away from the site.

3.2. Stripping and Storage of Topsoil

3.2.1. Carefully strip the topsoil from areas affected by new construction.

3.2.2. Stockpile the topsoil on the site at a location or locations approved by the Architect and General Contractor for later use on this project. At the completion of construction, excess material is to be removed from site at the Contractor's expense. Note that because of the 'tight' nature of the site, temporary removal off site of top soil material may be required if storage areas designated by the Architect are used by the General Contractor for other purposes.

3.2.3. Maintain topsoil stockpiles separate from any other stockpiles and protect from contamination.

3.2.4. Prevent silt runoff from stockpiles and site with the use of silt fences and/or straw bale barricades.

3.3. Excavation

3.3.1. Footings are designed for a maximum safe allowable bearing pressure of 145 KPa.

3.3.2. Notify the Engineer of any unusual soil conditions encountered during excavation so that corrective action may be taken, if necessary.

3.3.3. Where excavations for footings are accidentally over-excavated, fill the over-excavated portion with lean concrete fill to the founding elevation shown on the plans, at no additional cost to the Owner.

3.3.4. Provide excavations for footings of sufficient width for the construction and inspection of formwork and the satisfactory and safe execution of the work. In general, provide not less than 450 clear of all construction.

3.3.5. Trim the bottom of all excavations true to line and grade, and remove all loose, wet, soft or unsatisfactory material.

3.3.6. Install footings at lower elevations prior to installing adjacent footings at higher elevations to ensure that bearing capacity of upper levels is not adversely disturbed.

3.3.7. Notify the Testing Company when each phase of the excavation is completed so that bearing surfaces may be inspected.

3.3.8. All excavations into native subsoil are to be carried out using a smooth-blade bucket to preclude disturbance of the subgrade by normal bucket teeth.

3.3.9. Protect all soils supporting footings and slab on grade against penetration of frost and rain before, during and after placement of concrete.

3.3.10. Unless noted otherwise on plan the drawings indicate footings bearing down onto the approved undisturbed sand layer at elevation bubbles indicated on the foundation Plan.

3.3.11. Below slab-on-grade areas excavate down a minimum of 300 below slab-on-grade or as required to remove topsoil or otherwise unsuitable material and proof roll subgrade with a heavy roller. Sub-excavate any soft or wet spots as identified by the Geotechnical Engineer and replace with granular 'B' material or approved 'PR' material compacted to 98% standard proctor maximum dry density.

3.3.12. After construction of forms minimize disturbance of subgrade within footing forms. If soils within footings become disturbed remove all loose material with hand shovels down to sound soil.

3.4. Pumping and Dewatering

3.4.1. Keep all excavations, pits and trenches free from accumulations of water from all sources, including ground water, perched groundwater, rain and surface water, at all times by pumping or other methods satisfactory to the Geotechnical Engineer. Refer to Soils Report for surface water and ground water control methods.

3.4.2. Conduct dewatering operations, when required, in such a manner as to avoid damage to work under construction or existing adjacent structures and so as not to weaken the strength of bearing soils or to endanger the stability of banks or slopes.

3.5. Backfill and Compaction

3.5.1. After the construction of footings, walls or piers, and the approval of the work by the Consultant, backfill and compact interior side of foundation walls with granular 'B' material to the elevations shown on the drawings.

3.5.2. Backfill and compact in equal lifts on each side of walls below grade. Maximum grade difference on opposite sides of non-retaining or basement walls is not to exceed 450. Do not backfill basement walls that are to be laterally supported at the top of the wall until such lateral support, in the form of the first floor framing, is cast and cured.

3.5.3. Deposit and spread granular materials in uniform layers not exceeding 300 (loose measurement) in depth.

3.5.4. Compact all granular materials to not less than 98% of Standard Proctor Density, except as noted on drawings or specifications. Maintain optimum water content for proper compaction by the addition of water as required.

3.5.5. Compact using approved vibratory plate tampers or vibratory rollers, except when working close to silt or other materials which may be adversely affected by vibration; in which case, use approved non-vibratory rollers to avoid disturbance of the sub-grade.

3.5.6. Immediately below sidewalks, place a 150 layer of Granular `A' compacted to 98% of Standard Proctor Density.

3.5.7. Backfill below landscaped areas on the exterior side of the wall exclusive of the basement area can consist of approved site excavated materials compacted in 300 lifts to 96% standard proctor maximum dry density. Slope grade away from the building as shown on Architectural site plan and building sections.

3.5.8. Backfill exterior side of all foundation walls below sidewalks and paved areas, exclusive of areas adjacent to basement walls, can consist of approved site excavated materials, or imported granular 'B', compacted in 300 deep lifts to 98% standard proctor maximum dry density. Backfill to extend up to the underside of a 150 granular 'A' layer below the sidewalk.

3.5.9. Backfill on the interior side of all foundation walls up to the underside of the 200 stone layer to consist of approved pit-run, or granular 'B' material placed and compacted in 300 deep loose lifts to 98% standard proctor maximum dry density.

3.5.10. Refer to typical details for backfill adjacent to basement and retaining walls below landscaped areas for minimum width of free draining granular material. This material can consist of free draining pit run or granular 'B' material placed and compacted in 300 deep lifts to 98% maximum standard proctor dry density. Materials directly adjacent to wall to be free of large boulders that may damage waterproofing. Backfill outside of the free drainage zone can be consist of approved site excavated materials placed as indicated in typical details and compacted to 98% standard proctor maximum dry density.

3.5.11. Backfill below asphalt or concrete paved areas directly adjacent to basement walls to consist approved pitrun or granular 'B' materials up to the underside of the paving subgrade layer compacted in 300 deep loose lifts to 98% standard proctor density. Fills directly adjacent to wall to be free of large boulders that may damage waterproofing.

3.5.12. Use hand operated compaction equipment within the lesser of 3m or the height of the wall, for pit walls and retaining walls.

3.5.13. Protect all fill materials supporting slab on grade against penetration of frost and rain before, during and after placement of concrete.

3.5.14. Place weeping tile behind all basement, and retaining walls as indicated in on drawings or typical detail. Completely wrap geotextile fabric around stone cover and lap a minimum of 400mm.

3.6. <u>Sub-Floor Granular Fill</u>

3.6.1. Proof roll all existing fill materials with a heavy roller and subexcavate any soft or wet spots.

3.6.2. Provide a minimum of 200mm of 19mm crushed stone material under the slab-on-grade compacted to 100% standard proctor dry maximum density.

3.6.3. Fill below 200 crushed stone layer to consist of approved pit run or granular 'B' material down to approved subgrade for footings bearing on undisturbed soil. Compact Granular materials in 300 maximum loose lifts to 98% standard proctor dry density.

3.6.4. Take care not to damage any under-floor mechanical and electrical systems.

3.6.5. Remove clay, silt, dirt, and construction debris from the granular layers.

3.6.6. Ensure all electrical and mechanical piping runs in granular layers below the underside of the floor slab.

3.7. Grading

3.7.1. Rough grade outside the foundation walls (where applicable) to the lines and grades shown on the final site plan.

3.7.2. Rough grade to within 150 below the underside of exterior sidewalks and place layer of Granular 'A'

3.8. Field Quality Control

3.8.1. All materials and workmanship shall be subject to test and inspection by a Testing and Inspection Company appointed by the Consultant.

3.8.2. The cost of testing, except as noted in paragraph 3.08.C will be paid through a cash allowance.

3.8.3. Material or workmanship which fails to achieve the specified standards shall be re-compacted or replaced as directed by the Consultant and additional tests made. The cost of such additional testing and the cost of remedial action shall be at no additional cost to the Owner.

3.8.4. The foundation subgrade will be inspected by the Inspection Company immediately following final preparation of the excavation by the Contractor. The Inspection Company may direct that the depth of excavation be increased to reach a competent bearing stratum if existing soil conditions at the specified elevation are not satisfactory.

3.9. Clean Up

3.9.1. At the completion of the work in this Section, remove from the site any excess materials, debris and equipment.

END OF SECTION

PART 1 - GENERAL

1.1. General Requirements

1.1.1. This section specifies the supply and placement of mechanical seeding in all areas indicated as such on the drawings to the satisfaction of the specifications.

1.1.2. Related work elsewhere, **Topsoil and Finished Grading**, Section 02212.

1.2. Quality Assurance

1.2.1. Obtain approval of seed mixture in writing from the Consultant before work commences.

1.2.2. The contractor must have five (5) years of experience in mechanical seeding work. All crew members must be under the direction of a skilled foreman.

1.3. Scheduling

1.3.1. Schedule mechanical seeding to coincide with preparation of soil surface.

1.3.2. Recommended schedule for mechanical seeding using grass mixtures to be performed only during the periods of March 1 to June 30 and August 1 to December 31.

1.3.3. No work shall be performed when the ground is frozen, wet or otherwise untillable, or when even distribution of materials cannot be obtained.

PART 2 - PRODUCTS

2.1. Delivery and Storage

2.1.1. The seed mixture shall be mixed and supplied by a recognized seed house with tested rates for purity and germination of not less than government standard rates.

2.1.2. All grass seed specified, shall be mixed and supplied by a recognized seed house with tested rates for purity and germination of not less than government standard rates.

2.1.3. Seed shall be packed in a bag clearly showing the name of the supplier and indicating the certified quantities of different types of the mixture. The Consultant may request a test for purity and germination.

2.2. Materials

2.2.1. Seed: “Canada pedigreed grade” in accordance with Government of Canada Seeds Act and Regulations, having minimum germination of 75% and minimum purity of 97%.

2.2.2. Mixture: “Certified”, “Canada No. 1 Lawn Grass Mixture” in accordance with Government of Canada Seeds Act and Regulations with the following mixture composition at a rate of 185kg/Ha.:

20% Kentucky Bluegrass
50% Creeping Red Fescue
20% Barry or Pinnacle Ryegrass
10% Annual Ryegrass

2.2.3. Water: Potable and free of impurities that would inhibit germination and growth.

2.2.4. Fertilizer: To Canada "Fertilizers Act" and "Fertilizers Regulations". Adjust nitrogen and potassium on the field according to attached soil test report.

PART 3 - EXECUTION

3.1. Workmanship

3.1.1. Protect areas from trespass until grass is established.

3.1.2. Keep site well drained.

3.1.3. Perform work under optimum field conditions. Do not undertake seeding operation under adverse conditions including moisture, temperature, wind or scheduling related work.

3.1.4. Clean up immediately soil or debris spilled onto pavement and dispose of deleterious materials.

3.2. Preparation of Surfaces

3.2.1. Rough grade soil shall be scarified to a minimum depth of 75mm to produce an even, loose textured surface, free of all stones, roots, branches, etc., large than 25mm.

3.2.2. Fine grade areas to be seeded free of humps and hollows. Ensure all areas are free of deleterious and refuse materials. The finished grade shall be smooth, loose textured and free of all stones, roots, branches, etc., larger than 25mm diameter and shall be inspected by the Consultant prior to commencing seeding operations.

3.2.3. Areas to be seeded are to be cultivated to a minimum depth of 25mm.

3.3. Fertilizing Program

3.3.1. Fertilizer shall be applied by means of an approved mechanical spreader immediately prior to seeding. The fertilizer shall be well worked into the upper 50mm of soil by discing or harrowing.

3.4. Installation

3.4.1. Obtain Consultant's approval of topsoil grade and depth before starting seeding.

3.4.2. Sow during calm weather (winds less then 6mph) using equipment suitable for the area involved to the approval of the Consultant. Sow half of the required seed in one direction and the remainder at right angles. Incorporate the seed into the soil a minimum depth of 6mm simultaneously or within on half hour after seeding operation. Mix carefully with light chain harrow or wire rake and roll area

immediately afterward with water ballast type lawn or agricultural type roller.

3.4.3. Water with fine spray, avoiding washing out seed. Apply enough water to ensure penetration of minimum of 50mm.

3.4.4. Re-seed at 2 week intervals where germination has failed.

3.4.5. Protect seeded areas from trespass satisfactory to the Consultant.

3.5. Maintenance During Establishment Period

3.5.1. Perform the following maintenance operations from the time of the seed application until acceptance by Consultant. Such maintenance shall include all measures necessary to establish and maintain grass in a vigorous growth condition.

3.5.2. Grass Mixture:

3.5.2.1. Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.
3.5.2.2. Mow grass to 40mm whenever it reaches a height of 60mm.
3.5.2.3. Fertilized seeded areas after the first cutting to the specified rates.
3.5.2.4. Spread half of the fertilizer in one direction, and the remainder at right angles.
3.5.2.5. Eliminate weeds by mechanical means.
3.5.2.6. Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.
3.5.2.7. Erosion resulting from contractor's faulty workmanship and / or materials shall be repaired and reseeded at his expense.

3.6. Inspection

3.6.1. Acceptance inspection will be conducted within sixty (60) days after completion.

3.6.2. Where the contractor requests inspection for partial acceptance of mechanical seeding work, the contractor will notify the Consultant in writing at least two (2) days in advance.

3.6.3. Partial acceptance will be given when mechanical seeding work has been delayed due to circumstances beyond the control of the contractor or when further mechanical seeding work would be in accordance with good horticultural practice and would jeopardize the performance of work and materials.

3.6.4. At the time of inspection for acceptance, all mechanical seeded areas shall have a healthy and even stand of grass, free of thin, poor, or burned out patches.

3.7. Acceptance

3.7.1. Seeded areas will be accepted by the Landscape Architect provided that:

3.7.1.1. Plants are uniformly established and seed areas are free of rutted, eroded, bare or dead spots and free of weeds.
3.7.1.2. Seeded areas have been mown at least twice.
3.7.1.3. Seeded areas have been fertilized.

3.7.2. Areas seeded in the fall will be accepted in the following spring, one month after the start of the growing season, provided that acceptance conditions are fulfilled.

3.8. Maintenance During Warranty Period

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

3.8.1.1. Repair and reseed dead or bare spots to the satisfaction of the Consultant.

End of Section

PART 1 - GENERAL

1.1. Related Work

1.1.1. This section specifies the supply and implementation of maintenance for completed landscape construction, **up to Final Acceptance**.

1.1.2. Related work elsewhere:

Topsoil and Finished Grading, Section 02921
Topsoil, Section 02245
Planting - Trees, Shrubs and Ground covers, Section 02951
Seeding, Section 02486
Sodding, Section 02822

1.2. Quality Assurance

1.2.1. Maintenance is to be carried out by the installing contractor or an approved Landscape Maintenance Contractor using only experienced personnel under the direction of a skilled foreman.

1.2.2. The Landscape Maintenance Contractor will be responsible to the installing Landscape Contractor to ensure acceptance of the landscape contract for the one year final acceptance.

1.2.3. Use experienced, qualified personnel under the direction and supervision of a foreman with at least 5 years of Landscape Horticultural experience and a superintendent with at least 10 years of Landscape Horticultural maintenance experience.

1.2.4. Pesticides personnel shall be licensed.

1.2.5. Submit a written report if adjustments to the site are recommended/required for approval by the owner and/or architect.

1.3. Standards

1.3.1. All workmanship, materials, maintenance and maintenance techniques shall be in accordance with, or exceed the minimum applicable standards of the requirements of this Section, the Pesticides Act 1984, the Ontario Ministry of the Environment, the Ontario Ministry of Health, and the Ontario Pesticides Advisory Committee. Latest edition at Tender closing date and most stringent conditions apply.

1.3.2. All workmanship shall be first- class and materials new and of best quality. The Contractor shall pay due regard to the crisp, neat, clean, attractive appearance of the finished work. Have regard to local by-laws and regulations concerning the application of pesticides.

1.4. Requirements of Regulatory Agencies

1.4.1. Work of this section shall include protection measures consisting of materials, construction, and methods required by the Occupational Health and Safety Act, O-R, 213/91, of the Province of Ontario, and as otherwise imposed by

Jurisdictional Authorities to save persons and property from harm.

1.5. Product Delivery, Storage and Handling

1.5.1. Supply manufactured items such as fertilizer, bonemeal, mulch, etc., in standard containers, clearly indicating contents, weight, component analysis, and the name of the manufacturer.

1.6. Job Conditions

1.6.1. Proceed with maintenance operations during appropriate weather conditions.

1.7. Inspection

1.7.1. The Architect reserves the right to undertake periodic inspections to ensure quality of maintenance.

1.7.2. An inspection of the landscape contract will be made to provide Final Acceptance one year from the date of Provisional Acceptance. All related specifications must be satisfactorily addressed to meet Final Acceptance.

PART 2 - PRODUCTS

2.1. Fertilizer

2.1.1. Complete commercial slow release sulphur-coated urea fertilizer of approved manufacturer for April fertilizer application and complete commercial fertilizer for June and October fertilizer applications

2.1.2. Fertilizer: slow release 21-7-7

2.1.3. Water soluble 20-20-20 all-purpose fertilizer in a diluted solution may be used alternately upon written approval by the Consultant. Supply rate schedule for Consultant approval.

2.1.4. **RECOMMENDED RATES OF FERTILIZER FOR TREES**

Measure trunk diameter at 1.0 or 1.5m above the ground.
Rates are based on a complete fertilizer containing 10% nitrogen. Water thoroughly after fertilizing.

TREE TRUNK DIAMETER	QUANTITY OF FERTILIZER PER TREE
50 to 100 mm	0.5 kg
100 to 150 mm	1.5 kg
150 to 200 mm	2.0 kg
over 200 mm	3.0 kg

2.1.5. **RECOMMENDED RATES OF FERTILIZER FOR SHRUBS**

Type of Shrub	Grouped in Beds	Large Specimen
Deciduous	0.5-1.0 kg/10 sq.m	0.25-0.5 kg/plant
Broadleaf Evergreen	0.5-1.0 kg/10 sq.m	0.25 kg/plant
Narrow Leaf Evergreen	0.5-1.0 kg/10 sq.m	0.25-0.5 kg/plant

* Rates are based on a complete fertilizer containing 10% nitrogen. Water thoroughly after fertilizing.

Take soil samples for chemical soil tests and leaf samples for foliar analysis and have the testing done. Based on test results and within the minimum and maximum rates indicated above, adjust fertilization rates to meet plant nutrient requirements. As requested and as directed by the Owner, apply foliar spray or implant capsules to correct chlorosis.

2.2. Insect and Disease Control

2.2.1. For trees, shrubs and other planting, address specific diagnosed problems with currently recommended treatments as requested and as indicated by the owner.

2.2.2. Undertake regular site inspections and report in writing any problems to the Store Manager, Project Manager and or Architect.

2.2.3. The contractor is to provide, together with their tender, a copy of their Proposed Sustainable Pest Management and Monitoring Program for the site.

2.2.4. Applications or sprays will be done following authorization by the Owner.

2.2.5. Include an annual allowance of $2000.00 in the tender for the above work. Expenditures of this allowance will be authorized by the Owner.

2.2.6. Dormant oil spray in late April/early May and before leaf buds break. Insure that only tolerant plants receive this application.

2.3. Mulch

2.3.1. >Gro-Bark= or approved alternate.

2.3.2. The use of mulch, supplied in bulk, will not be permitted unless approved by the Consultant upon submission of sample and locations of source of supply.

2.4. Rodent Control

2.4.1. Clay tile, mouse bait stations baited with zinc phosphate - treated cracked corn.

2.4.2. Repellents containing Hiram.

2.4.3. Trunk wrap and guards

2.5. Water

2.5.1. Potable and capable of sustaining plant growth.

PART 3 - EXECUTION

3.1. Plant Material Maintenance

3.1.1. Trees, Shrubs and Other Planting

3.1.1.1. All plant materials shall be maintained by the Contractor immediately after planting has been installed and shall continue until the date of final acceptance.

3.1.1.2. Maintain all vegetation within the limit of contract work. Include both newly planted - young planted materials and well established older trees and shrubs. Instruct in writing any corrective or preventative measures necessary to ensure healthy plant growth. Report in writing any damage to plant materials, however caused.

3.1.1.3. The Contractor shall arrange through the landscape subcontractor for a reputable landscape maintenance contractor and meet on site jointly with the Consultant to review ongoing landscape requirements for the duration of the warranty period. The subcontractor shall have available his recommended maintenance schedule for this meeting. At the end of the warranty period, the landscape contractor shall advise the Contractor and the Consultant in writing and arrange a final acceptance site meeting.

3.1.1.4. Maintenance shall include all measures necessary to establish and maintain plants in an acceptable, vigorous and healthy growing condition including, but not limited to:

3.1.2. Landscape Maintenance Schedule

ACTIVITY	Apr	May	June	July	Aug	Sept	Oct	Nov
Spring Clean Up								
Fertilizers								
Weed Control								
Insect and Disease Control								
Pruning								
Watering								
Mulching								
Accessories								
Removals (Dead Material Only)								
Winter Preparation								

	Specified Schedule
	Schedule as Required

3.1.3. **Planting Maintenance: Trees, Shrubs & Ground Covers**

ACTIVITY	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV
Deciduous Trees								
Coniferous Trees								
Deciduous Shrubs								
Coniferous Shrubs								

3.1.4. **Maintenance Activity**

Spring - April, May

3.1.4.1. Remove all debris from landscaped areas and dispose of off-site.

3.1.4.2. Cultivate and neatly trim shrub beds and tree well saucers and dispose of debris off-site

3.1.4.3. Remove all dead/dying branches from trees, shrubs and ground covers and replace any dead/dying trees, shrubs or ground covers and dispose of debris off-site

3.1.4.4. Fertilize trees, shrubs and ground covers with a soluble soil drench fertilizer (20-20-20) or all-purpose organic commercial fertilizer.

3.1.4.5. Fertilize grassed areas with a high nitrogen organic commercial fertilizer (21-7-7 or equal). A combined weed and feed, commercially available fertilizer may be used. Follow manufacturer=s instructions utilizing a rotary fertilizer spreader.

3.1.4.6. If grassed areas are thin, aerate, spread sterilized (weed free) topsoil 25cm thick and evenly distribute grass seed with a rotary grass seed spreader. Water evenly, thoroughly and until seed has taken to grass, visually. Sod and water any significant bare spots. Do not apply herbicides to freshly seeded areas.

3.1.4.7. Mow grassed areas weekly, including edge trimming. Maintain a maximum height of 60mm. Do not cut more than one third (1/3) of the grass height at any one mowing. Trim and clip edges. Remove clippings after mowing and clipping.

3.1.4.8. Apply crab grass prevention prior to seed germination and herbicides monthly as required for general control of weed growth.

3.1.4.9. Applications of liquid herbicides, insecticides and fungicides should be undertaken by a licensed practitioner. Apply pesticides in accordance with Federal, Provincial and Municipal regulations as and when required to control insects, fungus and disease.

3.1.4.10. Planting of annual flowers in shrub beds and planters if specified is to be undertaken during the period between May 24th and June 15th.

3.1.4.11. Add a fresh layer of mulch to match existing mulch in shrub beds to insure a minimum depth of 75mm.

Summer – June, July, August

3.1.4.12. Watering of grassed areas to commence on a regular basis and continue with intensity depending on amount of rainfall.

3.1.4.13. Mow grassed areas weekly, including edge trimming. Maintain a maximum height of 60mm. Do not cut more than one third (1/3) of the grass height at any one mowing. Trim and clip edges. Remove clippings after mowing and clipping.

3.1.4.14. Prune trees when full leaf growth is achieved, removing irregular or obscuring branch growth. Do not remove tree tops / leaders. Dispose of all pruning debris off-site.

3.1.4.15. Do not prune Municipal owned trees. If pruning or removal is required, contact Municipality.

3.1.4.16. Prune shrubs and ground covers as required, maintaining natural growth habit and form.

3.1.4.17. Fertilize trees, shrubs, ground covers and flowers with water soluble organic fertilizer or commercial 20-20-20 or equal. Tree fertilizer spikes are encouraged. Follow manufacturer's instructions. Do not over fertilize!

3.1.4.18. Apply organic fertilizer 21-7-7 to all grassed areas using a commercial fertilizer spreader.

3.1.4.19. Applications of liquid herbicides, insecticides, fungicides are to be undertaken by a licensed herbicide/insecticide practitioner only and only as required. This applies generally for all plantings and lawns.

3.1.4.20. Remove and dispose of debris on a regular basis.

3.1.4.21. Major problems related to planting condition or mortalities should be immediately reported in writing to the Store Manager, Project Manager and or Architect.

Fall – September, October, November

3.1.4.22. Continue watering as required. Deep water evergreen trees.

3.1.4.23. Continue light pruning of shrubs if required, remove and dispose of dead or diseased branches.

3.1.4.24. Continue to mow grassed areas weekly, including edge trimming. Maintain a maximum height of 60mm. Do not cut more than one third (1/3) of the grass height at any one mowing. Trim and clip edges. Remove clippings after mowing and clipping.

3.1.4.25. After flowers have stopped blooming, remove and dispose of off-site.

3.1.4.26. Commence clean-up of all fallen leaves and continue until trees are bare. Note: All fallen leaf material is recyclable and is to be disposed of off-site.

3.1.4.27. Winter burlap wrap protection is recommended for all upright formed evergreens, evergreen trees and fragile shrubs less than 2 years old against salt spray and winter desiccation. **This is mandatory during fall planting.**

3.1.4.28. Clean and remove any fallen leaves from all catch basin grates and, where possible, lift grates and clean out catch basins.

3.1.4.29. Apply winterizer fertilizer to all grassed areas.

3.2. General Irrigation Maintenance

3.2.1. Watering should take place during the early morning hours (12:00 am to 6:00 am)

3.2.2. Irrigation controller (if provided) should be set station to station for the above watering hours (refer to Owner's Manual)

3.2.3. Verify all sprinkler settings, overlap, nozzle sizes and operating pressures.

3.2.4. Adjust the flow control on automatic valves where necessary.

3.2.5. Program the controller into a logical sequence, to maintain a heavy infrequent water cycles as opposed to light frequent settings.

3.2.6. Contractor to note and document irrigation activity and report any dry areas, wet areas or damaged hardware to Store Manager, Project Manager and or Architect.

3.2.7. Damage caused by maintenance contractor will be repaired immediately at the cost of the contractor.

3.2.8. Contractor to monitor rain sensor hardware and report any problems immediately to the Store Manager, Project Manager and or Architect.

3.2.9. If no automated irrigation system has been provided, utilize hose bibs on the building in conjunction with buried yard hydrants (quick couplers) for watering operations.

3.2.10. Manual watering should ensure deep watering of trees, shrubs, ground covers and grassed areas.

3.2.11. Critical watering months are June, July, August.

Spring Start Up and Fall Winterization

3.2.12. Flush all lines and ensure that all water is expelled from the system as per manufacture=s specifications.

3.2.13. Inspect all visible piping, and walk all buried lines for any leakage.

3.2.14. Report all repairs necessary to render the system in good working order shall be completed at this time. Contractor to submit any documentation and or cost estimates of repairs for written approval.

3.2.15. Verify all sprinkler settings, overlap, nozzles and operating pressures.

3.2.16. Contractor to replace battery and check electrical connections.

3.3. Final Acceptance

3.3.1. Prior to final acceptance the Contractor shall provide the Architect with a complete written maintenance schedule for all plant materials, unless provided for otherwise in the Contract Documents. Include documentation of all dates when maintenance took place during maintenance period, including time and duration.

3.3.2. Notwithstanding any provisions in the Contract Documents, the Contractor shall be responsible for making monthly inspections of all planting during the warranty period and submit a written report of each inspection to the Store Manager, Project Manager and Architect. Written Reports may include:

3.3.2.1. Maintenance work carried out.
3.3.2.2. Development and condition of plant materials.
3.3.2.3. Preventative or corrective measures required which are outside of Contractor's responsibility.

3.3.3. The Contractor shall instruct the Store Manager, Project Manager and Architect in writing of any corrective or preventive measures necessary to ensure healthy plant growth. Any damage or theft to plant materials from any source whatsoever shall be reported in writing to the Architect.

3.3.4. Contractor to remove all Tree Stakes and Hardware after the second growing season.

3.4. Guarantee

3.4.1. Guarantee all plant material for a period of one year commencing on the date of provisional acceptance.

3.4.2. During the guarantee period replace all material that is dead or not in satisfactory, healthy growing state or which does not meet the requirements of the specifications, at no extra cost to the contract. The replaced plant does not have an extended guarantee. Final determination of the acceptability of the plants will be made by the Architect.

3.4.3. All replacements must be plants of the same size and species as shown on the plant list, supplied and planted in accordance with the drawings and specifications.

END OF SECTION

PART 1 - GENERAL

1.1. Description

1.1.1. General Instructions

1.1.1.1. Division 1 and General Requirements are a part of this section and shall apply as if repeated here.

1.1.2. Related Work Specified Elsewhere

1.1.2.1. Division 4 - Masonry
1.1.2.2. Division 9 - Floor Finishes

1.1.3. Work Installed But Furnished by Other Sections

1.2. Applicable Standards

1.2.1. All standards to be latest issue with amendments.

1.2.2. Ontario Building Code.

1.2.3. CSA Standard CAN3-A23.1, A23.2 and A23.3.

1.2.4. ACI Standard 302, "Recommended Practice for Concrete Floor and Slab Contraction".

1.2.5. ACI Standard 347, "Formwork for Structural Concrete".

1.3. Shop Drawings

1.3.1. Examine all drawings forming a part of this contract and conform to the requirements of all such drawings.

1.3.2. Prepare reinforcing steel placing drawings and detailed bending lists to supplement the drawings prepared by the Architect. Show sizes, position, extent, type and arrangement of bars and their steel grades. Scale of plans to be a minimum of 1:100; sections/details minimum 1:50.

1.3.3. Submit shop drawings in accordance with the General Instructions.

1.3.4. Do not cut or fabricate reinforcing steel material until the Engineer and Architect have reviewed and approved the shop drawings.

1.3.5. The Engineer and Architect's review will cover the general arrangement of the reinforcing steel, but the responsibility for errors in sizes, spacings, dimensions and details shall remain with the contractor.

1.4. Coordination and Cooperation

1.4.1. Coordinate the work of this section with the General Contractor's scheduling in accordance with the General Instructions.

1.4.2. Coordinate the work of this section with the work of other sections and advise other trades when materials to be built into concrete will be required.

1.4.3. Install any items furnished by others, miscellaneous iron work, anchors, anchor bolts, pipe sleeves, etc., that are to be built into any part of the concrete work. Form all holes and openings required to accommodate the work of other trades.

1.4.4. Make good all openings left in construction around pipes, pockets for anchorages, etc., for other trades for where existing concrete must be broken out.

1.4.5. Examine Mechanical/Electrical drawings for housekeeping pads, inertia slabs and bases.

1.5. Design and Detailing Criteria

1.5.1. **Formwork** - in accordance with CAN3-A23.1 and the recommendations of A.C.I. Standard 347.

1.5.2. **Concrete** - design concrete mixes for the compressive strengths, workability requirements, etc., specified in Article 2.2 of this section in accordance with CAN3-A23.1. Submit mix designs for the review of the consultant, if requested, prior to commencement of construction.

1.5.3. **Reinforcing** - detail all reinforcing bends, hooks, splices, and anchorages in accordance with CAN3-A23.1 and the standards of the Reinforcing Steel Institute of Ontario.

1.5.4. Shoring of the composite metal floor deck will not be required.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. **Cement** - in accordance with CSA Standard CAN3-A5, "Portland Cement", Type 10. Consultant approved cementitious substitutes permitted to a maximum of 10% of the total cement mass.

2.1.2. **Aggregates**

2.1.2.1. Fine and coarse aggregate materials and grading in accordance with Section 5 of CSA Standard CAN3-A23.1.

2.1.3. **Reinforcing Steel** - new deformed bars in accordance with CSA Standard G30.8, G30.12-M or G30.13 with a guaranteed yield stress of 400 MPa. (58,000 psi.)

2.1.4. **Welded Wire Fabric** - in accordance with CSA Standard G30.5-1967. **Supply in sheets only.**

2.1.5. **Concrete Admixtures** - type 1, water reducing admixtures currently approved for use by the Ontario Ministry of Transport in accordance with O.P.S.S. Form 1303, "Material Specification for Air Entraining Agents and Chemical Admixtures".

2.1.6. **Premoulded Filler** - 10 mm thick, asphalt impregnated Flexcell as manufactured by G.F. Sternson or approved equal.

2.1.7. **Spray-Applied Membrane** - in accordance with ASTM Standard C309, Type 1, Class B - VOCOMP-20 by Meadows.

2.1.8. **Vapour Barrier** - 10 mil polyethylene to CAN/CGSB 51.34.

2.1.9. **Floor Sealer** - 1 part moisture-cured (non-staining) acrylic - VOCOMP-25 by Meadows.

2.1.10. **Grout** - non-ferrous, non-shrink grout.

2.1.11. **Superplasticizer** - Melment by Sternson or Conchem S.P.N.

2.1.12. **Circular Column Forms** - fibre glass without spiral pattern. Steel forms are not acceptable for this project.

2.1.13. **Carborundum Grits** - 8/16 (rice size) grits.

2.1.14. **Non-Metallic Integral Hardener** - pre-mixed Colorcron by Master Builders (colours to be selected later).

2.1.15. **Plywood** - in accordance with CSA A23.1.

2.1.16. **Form Ties** - for general wall areas, removable snap-off metal ties that, after removal of forms, no metal is within 25 mm of the finished surface.

2.1.17. **Structural steel support angles** – Pre-manufactured galvanized steel support shelf angles as detailed on drawings

2.2. Concrete Mixes

2.2.1. Job-mixed concrete will not be allowed on this project.

2.2.2. Provide mixed-in transit, ready-mixed concrete in accordance with CSA Standard CAN3-A23.1 obtained from a supplier approved by the Engineer for use on this project.

2.2.3. Mix all concrete with materials so graded and proportioned produce a plastic mass of such consistency that it will flow slowly under its own weight and which can be readily worked into corners of forms and under and around reinforcing without forming voids or honeycombed surfaces.

2.2.4. Furnish to the contractor, a 'delivery ticket' for each batch of concrete delivered to the site, which shall be kept on record for the inspection of the Engineer. Each ticket shall show the following.

2.2.4.1. Date and truck number.
2.2.4.2. Contractor's name.
2.2.4.3. Job designation.
2.2.4.4. Specified concrete strength, slump, air content and admixture.
2.2.4.5. Batch volume.
2.2.4.6. Time of batching.

2.2.5. Proportion the materials in accordance with the mix designs supplied under Article 1.7 of this section to provide the following specified design strengths and slumps.

MIX LOCATION	SPECIFIED 28 DAY COMPRESSIVE STRENGTH MPa.	SLUMP (m.m.)	ENTRAINED AIR
Lean Fill	15	125	nil
Footings, Interior Walls and Piers	25	75 ± 25	nil
Interior Slabs, Slabs-on-Deck	25	75 ± 25	nil
Exterior Slabs, Piers, Ramps and Perimeter Foundation Walls	30	75 ± 25	6% ± 1%

2.2.6. Fine and coarse aggregate grading in accordance with CSA Standard CAN3-A23.1-M77.

2.2.7. Chemical admixtures if used shall be used in strict accordance with the manufacturer's directions. **The use of calcium chloride or any other type of accelerating chemical admixture will not be allowed unless specified by the consultants.**

2.2.8. Note that the required average compressive strength must be greater than the specified compressive strength to allow for the appropriate standard deviation of the particular batch plant.

2.3. Fabrication of Reinforcing Steel

2.3.1. All reinforcing steel shall be provided and bent by a supplier approved by the Engineer.

2.3.2. Fabrication of bends, hooks and other shapes in accordance with CSA Standard CAN3-A23.3-M and the Reinforcing Steel Institute of Ontario Standards.

2.3.3. Fabrication and detailing of splices and laps in accordance with CSA Standard CAN3-A23.3-M for the appropriate specified yield strengths except that all lapped splices in welded wire fabric shall be lapped on full mesh plus 50 mm.

2.4. Quality Control

2.4.1. Provide such samples of materials and mill test reports as may be required by the Architect at no cost to the Owner.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Examine and obtain all necessary measurements of previously executed work which may affect the work of this section prior to commencing operations.

3.1.2. Report any discovered discrepancies to the Architect so that instructions can be given for the necessary remedial action.

3.2. Workmanship

3.2.1. Formwork

3.2.1.1. Construct all forms to have sufficient strength, stability and rigidity to prevent bulging or deflection under the liquid weight of concrete and to support in addition, all construction loads to which they may be subjected.

3.2.1.2. Erect forms to the lines, dimensions and elevations shown on the drawings such that the completed work is within the tolerance limits for reinforced concrete buildings in accordance with ACI Standard 347. Note that dimensional tolerances for anchor bolt locations is more restrictive. Conform to erection diagrams and CISC Code of Standard Practice.

3.2.1.3. Immediately prior to concreting, inspect all forms to ensure that they are properly placed, sufficiently rigid and tight, thoroughly clean, properly treated and free from snow, ice, or other foreign materials.

3.2.1.4. Provide for all openings, offsets, risers, brackets, haunches, depressions and curbs as shown or required in the formwork.

3.2.1.5. For interior columns exposed to view in the completed structure, horizontal construction joints are to be at least 2800 above the floor. For exterior columns, no horizontal construction joints are to be visible in the completed structure. For exposed circular columns, forms must not leave spiral appearance.

3.2.1.6. For typical wall surfaces, arrange form ties such that after removal of the forms, no metal is within 25 of the finished surface.

3.2.1.7. Clean forms of all debris prior to concreting. Provide temporary openings at the base of walls, column forms and at other locations where necessary to facilitate cleaning and inspection. Place openings so that 'wash water' will have a clear run to the outside of the forms.

3.2.1.8. Provide 25 x 25 chamfers on all corners of concrete, exposed to view in the finished structure.

3.2.1.9. Coat forms with a non-staining mineral oil prior to the placing of reinforcing steel in accordance with CSA Standard CAN3-A23.1. Where concrete surfaces are to receive a final coat of paint, plaster, etc., omit the form oil and wet down the forms just prior to concreting.

3.2.1.10. Place continuous dovetail anchor slots (supplied by Division 4) as required to support the ends of abutting masonry walls and vertically at 6000 o.c. (maximum) on concrete surfaces which are faced with masonry, including walls and column faces.

3.2.1.11. Place anchors required for the support of mechanical or electrical equipment, structural steel, and miscellaneous iron which is to be cast into the concrete as supplied by other Divisions.

3.2.1.12. Place continuous pre-manufactured Galvanized steel support shelf angles as detailed on drawings. Anchor steel tails to reinforcing steel to prevent rotation during pours.

3.2.1.13. Immediately prior to concreting, inspect all forms to ensure that they are properly placed, sufficiently rigid and tight, thoroughly clean, properly treated and free of snow, ice or other foreign materials. Do not use chemicals for snow/ice control.

3.2.1.14. Composite steel deck will not require shoring.

3.2.1.15. Formwork approved for concreting shall be properly protected until

concrete is placed.

3.2.1.16. Exercise particular care in stripping the tops of foundation walls and piers to avoid chipping, spalling, or gouging of concrete edges.

3.2.1.17. Stripping of forms shall be in accordance with Section 11 of CSA Standard CAN3-A23.1 and subject to the approval of the Consultant.

3.2.2. **Reinforcing Steel**

3.2.2.1. Placing, spacing, splicing and protection of reinforcement in accordance with CSA Standard CAN3-A23.3

3.2.2.2. Maintain the cover required for reinforcement as shown on the drawings. Where not specifically shown, refer to CSA Standard CAN3-A23.1

3.2.2.3. Supply and install 100 x 100 x 75 brick chairs for the support of reinforcing in slabs-on-grade of a type and in a manner which will not puncture the vapour barrier. Space chairs 1200 on centre each way. Lap welded wire fabric at least one mesh plus 50 mm at all splices.

3.2.3. **Vapour Barrier**

3.2.3.1. After all subgrade work is complete and approved, place vapour barrier for slabs on grade.

3.2.3.2. Lap sheeting minimum 150 at all joints and turn up at perimeter walls and piers 100 min.

3.2.4. **Concrete Placing**

3.2.4.1. All conveying, depositing and compaction of concrete in accordance with CSA Standard CAN3-A23.1-M.

3.2.4.2. Maximum elapse of time between mixing and placing shall not exceed 1 1/2 hours. In hot weather, this time period may be reduced, or the use of a retarding admixture may be authorized by the Consultant to ensure satisfactory concreting.

3.2.4.3. Thoroughly compact all concrete during placing by the use of electrical internal vibrators to be a type and design approved by the Engineer to ensure that the finished concrete is free of voids or other defects.

3.2.4.4. Maintain sufficient vibrators on site to keep pace with the rate of pouring but in any case, not less than two shall be available at the site for any pour.

3.2.4.5. Carefully concrete in all piping, sleeves, conduits, etc., furnished by the Mechanical and Electrical trades.

3.2.4.6. Where concrete is placed on a membrane vapour barrier, take any necessary precautions to ensure that the membrane is not damaged by screeding, reinforcing or concreting operations. Place concrete for slab-on-grade from buggies properly supported on runways and not run directly on the reinforcing and/or membrane.

3.2.4.7. Strike off floor surfaces at the level shown on the drawings by means of previously set, continuous pipe screeding, set on adequate supports.

3.2.4.8. Notify the Engineer at least 24 hours in advance of any scheduled pour so that reinforcing and forms may be reviewed as determined by the Engineer.

3.2.4.9. Ensure that reinforcement, inserts, etc., are not disturbed during concrete placement.

3.2.5. **Concrete Protection and Curing**

3.2.5.1. Protection and curing of concrete in accordance with Section 21 of CSA Standard CAN-A23.1. Note that wet curing of all elements is required for a period of 7 days or until the concrete reaches the design strength.

3.2.5.2. Maintain all equipment and materials for the protection and curing of concrete on site, ready to use before concrete placing is started.

3.2.5.3. Completely cover slabs with 4 mil polyethylene sheeting, properly lapped at side and edge laps and weighted down.

3.2.5.4. A sprayed-on membrane curing compound may be used for surfaces listed under paragraph 3 in lieu of polyethylene sheeting for concrete poured between April 1 and October 14. Sprayed-on curing compounds must be of a type which will not affect the adhesive of flooring materials and must be approved for use by the Engineer. Apply in strict accordance with the manufacturer's directions.

3.2.6. **Cold Weather Requirements**

3.2.6.1. All concreting operations during cold weather in accordance with Section 21 of CSA Standard CAN3-A23.1.

3.2.6.2. Remove and replace all concrete damaged by frost or freezing at the direction of the Engineer at no cost to the Owner.

3.2.6.3. Accelerating chemical admixtures or calcium chloride shall not be used.

3.2.7. **Hot Weather Concreting**

3.2.7.1. All concreting operations during hot weather in accordance with Section 21 of CSA Standard CAN3-A23.1.

3.2.7.2. The use of a water reducing-retarding chemical admixture in the concrete mix may be required at the Engineer's discretion.

3.3. Finishing of Horizontal Surfaces

3.3.1. **Floors**

3.3.1.1. Refer to ACI Standard 302 for recommended procedures for concrete floor and slab construction and finishing and to ACI Standard 301, Specification for Structural Concrete. Maintain surface tolerances in accordance with Section 11.9 of that ACI 301 for Class A tolerance.

3.3.1.2. Concrete floors which are to receive carpet, resilient flooring, mosaic tile, or be left exposed shall be steel floated with a disc type power floating machine, have a 600 mm disc, and weighing at least 135 kg. Continue the floating operation until sufficient moisture is brought to the surface to fill all voids. After floating when the floor has hardened sufficiently so that excess fines will be brought to the surface, trowel with a steel trowel to a surface free of all pin holes. The floor must not be used for seven (7) days after completion of trowelling, and only light use shall be permitted for an additional seven (7) days.

3.3.1.3. Concrete floors shall be sloped where required to floor drains at 1:50 and/or as directed by the ARCHITECT.

3.3.1.4. Concrete floor areas designated in the room schedule to be left exposed shall be finished as per Items 2 and 3 above with the addition of a factory pre-mixed non-metallic hardener. Apply in two separate shakes in strict accordance with the manufacturer's instructions for a combined application of 3.5 kg/m². Following finishing operations, apply

unthinned sprayed-on curing and sealing compound in strict accordance with the manufacturer's instructions. Just prior to turn-over, clean these areas and apply one coat of compatible floor sealer in strict accordance with the manufacturer's instructions.

3.3.1.5. Exposed concrete stairs and slabs shall receive two 1.3 kg/m² "shakes" of carborundum grits in accordance with the manufacturer's directions, followed by a light broom finish to provide a neat, non-slip surface.

3.4. Construction Joints

3.4.1. Construction joints shall only be placed in locations approved by the Engineer or as shown on the drawings.

3.4.2. Construction joints shall be keyed and dowelled to the adjoining pour as detailed on the drawings.

3.4.3. Before placing adjoining concrete at construction joints, clean the existing surface of dirt, laitance and loose aggregate.

3.5. Isolation Joints

3.5.1. Provide asphalt-impregnated fibreboard as follows:

3.5.1.1. At locations shown and noted on the drawings.

3.5.1.2. Isolation joints in the walls shall be as shown on the drawings.

3.6. Control Joints

3.6.1. Provide control joints as follows:

3.6.1.1. Where shown and noted on the drawings in walls and in floor slabs. Control joints in floor slabs shall be sawcut to the depth shown as soon after placing the concrete as the surface will allow without chipping but not later than 24 hours after placing.

3.6.1.2. In general, control joints will be required in foundation walls, approximately 3000 each way from corners and intersections, and spaced not further than 9,000.

3.7. Corrections and Remedial Work

3.7.1. The contractor will immediately correct by remedial work or replacement of the work, any items which do not conform to the Contract Documents or which are not within the specified dimensional tolerances.

3.8. Field Quality Control

3.8.1. All materials and workmanship shall be subject to test and inspection by a testing and inspection company appointed by the Architect.

3.8.2. The cost of all inspection and testing except as noted hereafter will be paid for by the Owner in accordance with the General Conditions.

3.8.3. Provide unhindered access to the project for the purposes of inspection and testing. Provide storage space and the necessary protection for test specimens against damage or loss while on site.

3.8.4. Provide representative samples of the materials as required by the testing and inspection company at no cost to the Owner.

3.8.5. All field tests for concrete quality and all criteria relating to failure to meet test requirements in accordance with CSA Standard CAN3-A23.1, Section 17, except as follows:

3.8.5.1. Each test shall consist of three standard cylinders accompanied by a slump test and measurement of air content (where applicable). Unless otherwise directed by the Engineer, one cylinder shall be tested in 7 days and the remaining two at 28 days.

3.8.5.2. The inspection company shall take concrete tests for:

3.8.5.2.1. Not less than one test for each class of concrete placed each day, and

3.8.5.2.2. Not less than one test for each 100 yards or portion thereof placed in any day.

3.8.6. The cost of any additional testing and/or the cost of replacement of any part of the structure, resulting from failure of the concrete to meet the test requirements shall be borne by the contractor.

3.8.7. Notify the testing company of the pouring schedule sufficiently in advance so that tests may be made.

3.9. Clean-up

3.9.1. At the completion of the work of this section, remove any excess materials, debris and equipment from the site.

End of Section

PART 1 – GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section

1.1.2.1. Section 03300: Concrete grout

1.1.3. Work Specified by This Section Performed by Other Sections

1.1.3.1. Section 04200: Unit Masonry

1.2. Quality Assurance

1.2.1. Requirements of Regulatory Agencies:

1.2.1.1. Modify requirements of the Specifications only as jurisdictional authorities may direct.

1.3. References

1.3.1. Reference Standards

1.3.1.1. ASTM C207, Specification for Hydrated Lime.
1.3.1.2. ASTM C270, Specification for Unit Masonry.
1.3.1.3. CAN/CSA-A5/A8/A362-M88, Portland Cements.
1.3.1.4. CAN3-A371-M84, Masonry Construction for Buildings.
1.3.1.5. CAN3-S304-M84, Masonry Design for Buildings.
1.3.1.6. CSA Standard A82.30-M1980, Interior Furring, Lathing and Gypsum Plastering.
1.3.1.7. CSA Standard A179-94, Aggregate for Masonry Mortar.
1.3.1.8. CSA Standard A179-94, Mortar and Grout for Unit Masonry.

1.4. Submittals

1.4.1. Affidavits

1.4.1.1. Submit to Architect affidavits of an inspection company that mortar materials conform to requirements of the Specifications, if requested.

1.5. Delivery, Storage and Handling

1.5.1. Handle and store cementitious materials protected against moisture.

1.5.2. Handle and store all mortar materials to prevent contamination by foreign materials, and damage by freezing or excessively high temperatures.

1.6. Site Conditions

1.6.1. **Environmental Requirements:**

1.6.1.1. When air temperature is less than 5 °C, mix mortar as specified in the applicable reference standard.

1.6.1.2. When outside temperature is below or likely to drop below 4°C the temperature of materials and surrounding air shall be heated to maintain at least 10°C during period of laying and for 72 hours thereafter. Submit for approval methods for protecting masonry against low temperatures. Do not add salt or anti-freeze to mortar to lower freezing point. Work to be executed in enclosure heated by smokeless means when temperature drops below -1°C.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Use materials only as specified in CSA Standard A179 referenced from CAN/CSA-A371-M84 and CAN/CSA-S304-M84. Ensure that water and aggregate used in mortar, other than in walls buried in earth, will cause no efflorescence.

2.1.2. **Cement:**

2.1.2.1. Portland Cement; Type 10, to meet specified requirements of CAN/CSA A5-M83.

2.1.3. **Sand Aggregate**

2.1.3.1. **For Normal Mixes**

2.1.3.1.1. A clean, masonry type, free of iron compounds in accordance with CSA A179-94, not less than 100% passing a No.8 sieve.

2.1.4. **Lime**

2.1.4.1. A Dolomitic lime, Type S conforming to ASTM C207 and CSA Standard A179-94.

2.1.5. **Water**

2.1.5.1. Verify that water used contains no salts to cause efflorescence.

2.1.6. **Mortar Colouring**

2.1.6.1. Lime and alkali-proof, non-fading, mineral oxide pigments manufactured especially for mortar use.

2.1.6.2. For "white" mortar, use Federal White.

2.1.7. **Non-Shrink Grout**

2.1.7.1. Embeco Pre-mixed Grout as manufactured by The Master Builders Company, or In Pakt as manufactured by C.C. Chemicals Limited, or Tartan Grout by Webster & Sons Ltd.,V1,2 or3 manufactured by W.R. Meadows .

2.2. Mixes

2.2.1. Mix mortars as specified in CSA Standard A179. Use only dry aggregate. Test for bulking to determine accurate proportioning.

2.2.2. **Only** pre-mixed portland cement/lime mortar mixes will be acceptable for this Project. Materials may be pre-bagged or shipped in bulk containers.

2.2.3. Acceptable suppliers shall include "Betomix Plus by Daubois Inc.", "Mega Mix Canada" by Macdonald Aggregates Inc., “Jiffy Mortar Systems “ by Jiffy Concrete Products, “Maxi-Mix “ dry pre-blended mortar system by Maxi-Mix Corp., or an approved alternative.

2.2.4. Use grey mortar unless otherwise specified.

2.2.5. **Match colour of mortar to existing concrete masonry units where exposed to view by incorporation of suitable cement and aggregate and colouring.**

2.2.6. At glass unit masonry blocks, use "super" white sand and Federal White.

2.2.7. Limit quantity of mortar colour to following percentages of cement content by weight.
2.2.7.1. : 15% for mineral oxides
2.2.7.2. : 3% for carbon black.

2.2.8. **Concrete Grout:** (for reinforced masonry)

2.2.8.1. Mix one part portland cement with three parts sand with water.

PART 3 - EXECUTION

3.1. Preparation

3.1.1. **Protection**

3.1.1.1. Provide waterproof protection over construction surfaces at mixing areas to prevent deposit on them of mortar and mortar materials.

3.2. Mortar Types

3.2.1. For laying masonry use portland cement/lime mortar types as follows:

3.2.1.1. : "M" in masonry walls in contract with earth.
3.2.1.2. : "S" for exterior masonry veneer including load-bearing back-up block.
3.2.1.3. : "N" unless otherwise specified.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section

Section 07920: Caulking and Sealants
Section 09250: Gypsum board closers at steel joists.
Section 09900: Painting and Finishing

1.1.3. Supply of Work Installed by This Section but Specified Elsewhere

Section 03300: To furnish reinforcing steel for masonry lintels and reinforced masonry walls
Section 05120: To furnish bearing plates
Section 05120: To furnish masonry anchors attached to steel structure
Section 05120: To furnish loose lintels

Masonry inserts and attachment devices to support the installations of other Sections, frames, and miscellaneous metal work.

1.1.4. Performance of Work Included in This Section, Specified in Other Sections

1.1.4.1. Section 04100: Mortar

1.2. System Description

1.2.1. Tolerances

1.2.1.1. Lay masonry to tolerances specified in CAN/CSA-A371-M84 and:

1.2.1.1.1. Level within 6 mm in any bay or 6m maximum distance, and 13 mm in 12 m or more.
1.2.1.1.2. Located from position shown, and from related position of columns, walls and partitions within 13 mm in any bay or 6 m maximum distance, and 19 mm in 12 m or more.
1.2.1.1.3. Opening sizes within 6 mm of designated dimension.
1.2.1.1.4. Columns and wall cross-section dimensions within minus 6 mm and plus 13 mm.
1.2.1.1.5. With joints to dimensions indicated, but in no case greater than 13 mm.

1.3. Quality Assurance

1.3.1. Requirements of Regulatory Agencies

1.3.1.1. Construct masonry as required by jurisdictional authorities.
1.3.1.2. Before commencing masonry work, verify that site conditions will allow construction of masonry within required limitations for wall heights, wall thicknesses, openings, bond, anchorage, lateral support, and compressive strengths of masonry units and mortars.

1.3.1.3. Construct masonry fire rated assemblies, which are validated by ULI, ULC, or NRC fire tests, in complete accordance with the test design specification. Fire rated assemblies constructed otherwise shall be approved only on presentation of affidavits that they are acceptable to the authorities having jurisdiction.

1.4. References

1.4.1. Reference Standards

1.4.1.1. Conform to CAN3-S304-M84 for Masonry Design and CAN3-A370-M84 and CAN3-A371-M84 for Masonry Construction specified in this Section.

1.4.1.2. Reference standards quoted in Contract Documents refer to:

1.4.1.2.1. ASTM A116-81, Specification for Zinc Coated (Galvanized) Iron or Steel Farm-Field and Railway Right-of-Way Wire Fencing.

1.4.1.2.2. ASTM A153-80, Specification for Zinc-Coating (Hot-Dip) on Iron and Steel Hardware.

1.4.1.2.3. CGSB Specification 1-GP-109M, Paint, Acid and Alkali Resistant, Black.

1.4.1.2.4. CAN3-A165 Series-M85, Concrete Masonry Units

1.4.1.2.5. CAN3-A370-M84, Connectors for Masonry.

1.4.1.2.6. CAN3-A371-M84, Masonry Construction for Buildings.

1.4.1.2.7. CSA Standard G30.12-M1977, Billet-Steel Bars for Concrete Reinforcement.

1.4.1.2.8. CAN/CSA-S304-M84, Masonry Design for Buildings.

1.4.1.2.9. CSA Standard G42-1962, Galvanized (Zinc-coated) Steel Farm-Field Wire Fencing

1.4.1.2.10. CAN/CSA-G164-M92, Hot Dipped Galvanizing of Irregularly Shaped Articles.

1.5. Submittals

1.5.1. Shop Drawings

1.5.1.1. Submit shop drawings of masonry reinforcement.

1.5.2. Samples and Mock Up

1.5.2.1. Submit samples of each type of masonry unit specified, and of accessories.

1.5.2.2. **Face Masonry Mock Up:** Prior to commencement of exterior cladding, lay up a section of typical wall construction on portion of building wall ready to receive cladding. Provide flashing, anchors, ties and weep procedures. Include two (600mm) lengths of base stone and up to 8 courses of Calcium Silicate Face Brick as specified. Include specified mortar. Mock Up Section should wrap a corner condition to indicate site cutting and breaking of end units at 90 degree turn.

1.6. Delivery, Storage, and Handling

1.6.1. Isolate masonry units from contact with ground and other materials until laid, to prevent staining.

1.6.2. Ensure that moisture content of concrete masonry units is maintained within specified limits from time of shipment from plant to time of installation.

1.6.3. Deliver Calcium silicate brick in protective film.

1.6.4. Cover masonry unit stockpiles while stored to prevent exposure to weather. Keep water out of all holes and reglets in units during freezing weather.

1.6.5. Handle and store masonry units to prevent soiling and chipping.

1.6.6. Deliver products to the place on site as directed, and to meet installation schedule.

1.7. Environmental Conditions

1.7.1. **Environmental Requirements**

1.7.1.1. When outside temperature is below or likely to drop below 4°C, materials and surrounding air shall be heated to maintain at least 10°C during period of laying and for 72 hrs. thereafter. Submit for approval methods for protecting masonry against low temperatures. All masonry units must be free from frost. Work to be executed in enclosure heated by smokeless means when temperature drops below 1°C.

1.7.1.2. Do not lay masonry units when air temperature is below -1° C.

1.7.1.3. Do not lay masonry during rain unless work is protected by sufficient enclosure.

1.7.1.4. Protect new masonry work from direct rays of sun to prevent fast drying and shrinkage.

1.7.1.5. Protect tops of all unfinished walls with weatherproof coverings at the end of each day's work, or upon stoppage of the work for any reason, or during rain, snow or sleet.

1.7.1.6. When air temperature is above 38 deg. C, or 32 deg. C with wind velocity greater than 13 km/hour, the spread of mortar beds shall be limited to 1200 mm and the masonry units shall be set within 1 minute of spreading the mortar.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Meet specified requirements of CAN/CSA-A370-M84 and CAN/CSA-A371-M84 for materials unless specified otherwise.

2.1.2. **Damp-proof Flashing**

2.1.2.1. Polyvinyl chloride flexible flashing membrane, 20mil thick, black; Rodoply by Sternson or Sealtight Flexguard by W.R. Meadows.

2.1.3. **Damp-proofing Flashing Lap Cement**

2.1.3.1. To meet specified requirements of flashing manufacturer.

2.1.4. **Joint Packing at Walls**

2.1.4.1. Expansion Joint Packing: Glass fibre insulation, rigid board, density of 48 kg/cu.m.

2.1.5. **Joint Reinforcement**

2.1.5.1. For Single Wythe Walls: Minimum 3.8 mm dia. side and cross rods, welded steel rod, galvanized, ladder design, DW 200 Dur-O-Wal Laudur by Dur-O-Wal Ltd. or Blok-Lok BL 10 ladder design by Blok-Lok Limited.

2.1.5.2. For Combination (Double Wythe) Solid Walls: 5 mm side and cross rods, welded steel rod, galvanized, ladder design, 4 wire, DW 220 Type by Dur-O-Wal ltd., Blok-Lok BL 32 by Blok-Lok Limited.

2.1.5.3. For Cavity Walls: Interior wythe shall be single wythe ladder type; hot dipped galvanized.

2.1.5.3.1. New exterior wythe shall be "Fero's" Block Shear Assembly. Shear connector plate shall be stainless steel: extruded polyethylene insulation support: Stainless Steel Vee-Tie. Spacing shall be 600 mm vertical and 800 mm horizontal. Fero Block Shear Anchor may be replaced with approval.

2.1.5.3.2. New exterior wythe for tie in to existing concrete block shall be Helifix Stainless steel ties.

2.1.5.4. For Masonry at Steel Columns: 5.21 mm diameter wire with 1.19 mm diameter wire and 10 mm x 10 mm openings.

2.1.5.5. For Type A and B masonry, use stainless steel joint reinforcement. For exterior masonry use stainless steel reinforcement. For interior use mill galvanized.

2.1.5.6. Brick Wythe with Metal Stud framing. Bailey Brick Connector ESS-2 with Triangle V Stainless Steel wire min 3/16” diameter. (or approved equal.)

2.1.6. **Dovetail Anchor**

2.1.6.1. 25.5 mm x 2 mm steel dovetail anchor, galvanized, with end crimped and bent.

2.1.7. **Dovetail Anchor Slots**

2.1.7.1. Fabricated of minimum .55 mm metal, galvanized after fabrication, minimum 27 mm depth, with cellular foam filler; by Richmond Acryo or "Beehive".

2.1.8. **Flexible Anchor**

2.1.8.1. To suit conditions and to allow for differential movement between the structure and masonry. Flex-O-Lok or Column-Lok by Blok-Lok Limited or similar anchor by Duro-O-Wal Ltd. of size and type to suit conditions and adequately anchor masonry.

2.1.9. **Weep Holes**

2.1.9.1. DA 1069 Cell vent by Dur-O-Wal Ltd. or Weephole Ventilator by Blok-Lok Limited.

2.1.10. **Cavity Sealer**

2.1.10.1. Closed cell Neoprene, or Ethofoam polystyrene by Dow Chemical of Canada Limited, continuous strip to fit tightly between inner and outer wythes of wall.

2.1.11. **Sheet Metal**

2.1.11.1. Expansion Joint: 0.55 mm thick cold rolled copper to meet specified requirements of ASTM Specification B370, formed with 63.5 mm deep bellows and 75 mm wide flanges with hemmed or offset edges to form anchorage in mortar joint.
2.1.11.2. Through Wall Flashing Support: 0.55 mm thick cold rolled copper to meet specified requirements of ASTM Specification B370, formed with 75 mm wide flanges with hemmed or offset edges to form anchorage in mortar joint.

2.1.12. **Through Wall Flashing**

2.1.12.1. Polyvinyl chloride flexible membrane, 20 mil thick, black; Rodoply by Sternson or Sealtight Flexguard by W.R. Meadows.

2.1.13. **Bituminous Paint**

2.1.13.1. To meet specified requirements of CSGB Specification 1-GP-108.

2.1.14. **Concrete Masonry Units**

2.1.14.1. To meet specified requirements of CSA Standard A165-M83.
2.1.14.2. 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.
2.1.14.3. For the purposes of this project, the mason is to source **American Imperial Unit** sizes for continuation and infill of existing adjacent conditions and **Metric Modular Units** for new construction. Coordinate with architect in advance if there is question.
2.1.14.4. Provide 100% solid units where required by jurisdictional authorities.
2.1.14.5. Moisture controlled ("M") units as approved by Architect.
2.1.14.6. **Lightweight Units**

2.1.14.6.1. Of slag aggregate manufacture. For use in all exposed partitions and exterior wall backup.
2.1.14.6.2. Hollow Units: H/7.5/C/M
2.1.14.6.3. Solid Units: S/15/A/M
2.1.14.6.4. American Imperial and Metric as indicated in .3
2.1.14.6.5. Colour: Grey

2.1.14.7. **Face Block Units**

2.1.14.7.1. **CMU 1** : Standard Smooth Face to match existing block in texture density and Colour.

2.1.15. **Natural Stone Masonry Units**

2.1.15.1. Natural Stone Masonry Units (NSMU): Base Course: 300 linear meters. Arriscraft 'Adair' Limestone. Acceptable Alternate: Mosa Dolomitic Limestone, type III High Density – ASTM C 568-08a by OSI Hard Surfaces.
- 2.1.15.1.1. NSMU 1: Sawn top, bottom side and face. Exposed faces medium dressed.
- 2.1.15.1.2. Colour: Blue grey veined.
- 2.1.15.1.3 Size: 190mmx 590mmx 90mm.

2.1.16. **Calcium Silcate Manufactured Brick Units.**

2.1.16.1. Calcium Silicate Brick Units (CSBU): Arriscraft Contemporary Brick.
2.1.16.2. CSMBU 1: Smooth top and bottom with frogs. Split face , with some split backs and split ends.
2.1.16.3. Colour: Blizzard
2.1.16.4. Size: 79mm x 385mm x 90mm

2.1.17. **Cast Stone Sill Units.**

2.1.17.1. Cast Stone Sill, colour to match CSBU - Blizzard.
2.1.17.2. Smooth all exposed sides.
2.1.17.3. Size: 79mm x 210 mm x lengths below.
- .1 26 units at 1420mm long.
- .2 35 units at 910mm long.
- .3 2 units at 2020 long.

Allow 3 additional pieces in each length for damage and breakage in addition to the above.

PART 3 - EXECUTION

3.1. Preparation

3.1.1. **Shelf Angles**

3.1.1.1. Install shelf angles supplied by 05500 or this section. Level, adjust and secure angles permanently in place.

3.1.2. **Protection**

3.1.2.1. 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.
3.1.2.2. Protect exposed external corners of masonry with materials which will not damage or soil finished surfaces.
3.1.2.3. Protect all finished surfaces from mortar droppings.
3.1.2.4. Take particular care to protect faces of concrete unit masonry from mortar droppings and smears as laying proceeds.
3.1.2.5. Turn over or cover scaffolds and mortar board at completion of each day's work to avoid staining of finished surfaces by splashed rain.

3.2. Laying Masonry

3.2.1. Lay masonry to meet specified requirements of CAN/CSA-A370-M84 and CAN/CSA-A371-M84, unless otherwise specified.

3.2.2. Lay masonry as shown on Drawings, and to minimize cutting of units.

3.2.3. Coordinate coursing of dissimilar sized units only as approved by Architect.

3.2.4. Use only dry and unfrozen materials.

3.2.5. Remove sections of masonry which have been frozen before laying of masonry continues.

3.2.6. Lay masonry in running bond with vertical joints of alternate courses in line and as indicated on drawings.

3.2.7. Align webs of concrete unit masonry vertically and with thick ends on top.

3.2.8. **Joints**

3.2.8.1. Make joints of uniform thickness with vertical joints from course to course maintained plumb.
3.2.8.2. Provide full bed and head joints for shear walls.
3.2.8.3. 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.
3.2.8.4. 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.
3.2.8.5. Trowel point joints in unparged masonry in contract with earth.
3.2.8.6. Rake out joints of masonry exposed to view to provide for caulking:
3.2.8.6.1. :at juncture of interior and exterior walls with columns.
3.2.8.6.2. :at interior with exterior walls.
3.2.8.6.3. :intersections of walls and partitions where joint reinforcement is installed.
3.2.8.6.4. :at caulked joints where indicated typically.
3.2.8.7. Cut joints off flush where thin-set tile will be applied, and where treatment is not otherwise specified.
3.2.8.8. Ensure that no mortar protrudes from joints on wall surfaces to which insulation vapour retarder or air barrier will be applied.

3.2.9. Stop off horizontal runs of walls by racking back 1/2 unit in each horizontal course; do not tooth.

3.2.10. Wet clay masonry units before placing. Wet faces of masonry in place before laying new masonry. Ensure that units have no water adhering to their surfaces when laid; but shall be wet only to ensure that complete hydration takes place during hot drying weather, and when unit absorption rates are greater than 0.11 ml/sq.cm/minute, so that the initial rate of absorption does not exceed above rate when laid.

3.2.11. Do not wet concrete units or existing brick units.

3.2.12. 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.

3.2.13. Use chipped and blemished concrete or brick 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.

3.2.14. Maintain continuous walls/piers bracing during construction until structure provides support.

3.2.15. **Lintels**

3.2.15.1. Build in lintels as identified in Structural Drawings on Lintel Schedule and supplied by Section 05500 or this Section. Set and level lintels on a bed of mortar.

3.2.16. **Built In Items**

3.2.16.1. Verify that built-in items specified in other Sections are available for building in before laying of masonry commences. Cooperate 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.

3.2.16.2. 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.

3.2.16.3. All structural steel columns which require masonry shall be built in solid with masonry.

3.2.17. Cope, cut and split concrete masonry units and brick 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.

3.2.18. Do not expose open cells, cores or frogs of masonry units to view.

3.2.19. Flush surface smooth with mortar masonry against which flashing rests to ensure that it is not punctured.

3.2.20. Extend all walls and partitions to underside of 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. Use 90 mm min. block to extend by steel joists and beams to deck. If 90 mm block cannot bypass steel terminate wall at underside of steel.

3.2.21. **Bonding**

3.2.21.1. Where bond pattern is indicated on Drawings use masonry bonding, or clip headers and install metal bond anchors.

3.2.22. **Masonry Anchorage**

3.2.22.1. Use dovetail anchors for slots at concrete construction.
3.2.22.2. Use flexible anchors at steel structure.
3.2.22.3. Build masonry tight to faces of structural members or as indicated on Drawings.
3.2.22.4. Bed anchors solidly in mortar joints.

3.2.22.5. Coordinate with Section 03300 to ensure that dovetail anchor slots in concrete are located correctly. Assist in their installation if requested.

3.2.23. **Lateral Support**

3.2.23.1. Lateral support clips are specified in Section 05500.
3.2.23.2. Coordinate with Section 05500 to ensure that lateral supports are located correctly. Assist in their installation if requested.

3.2.24. **Joint Reinforcement**

3.2.24.1. Install joint reinforcement in:

3.2.24.1.1. :solid walls and partitions, including foundation walls, constructed of
3.2.24.1.2. concrete masonry units.
3.2.24.1.3. :single wythes of concrete masonry units in cavity walls.
3.2.24.1.4. :single wythe concrete masonry walls and partitions.
3.2.24.1.5. :Combination solid walls and partitions incorporating concrete masonry
3.2.24.1.6. unit backup.
3.2.24.1.7. :single wythes of brick masonry in exterior cavity walls.

3.2.24.2. Place reinforcement continuously in horizontal joints at 400 mm o.c., beginning with course 400 mm above bearing, unless otherwise specified or indicated.
3.2.24.3. Place reinforcement additionally in courses 200 mm, 400 mm and 800 mm above and below openings, and extending 600 mm beyond jambs of openings.
3.2.24.4. Where changes in wall thickness occur, extend reinforcement of lesser width 450 mm beyond changes of width.
3.2.24.5. Lap reinforcement a minimum of 150 mm at splices.
3.2.24.6. Do not run reinforcement through control or expansion joints.
3.2.24.7. 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.
3.2.24.8. At masonry cladding for protected steel columns, lay specified reinforcement at every second course. Ensure that reinforcing is lapped to wall reinforcement and columns ties at least 150 mm.

3.2.25. **Deflection Space**

3.2.25.1. Incorporate a deflection space between tops of non load bearing walls and partitions and structure to prevent transference of structural loads to masonry.
3.2.25.2. Fill deflection space with glass fibre board compressed to 50% of original thickness to completely seal space.

3.2.25.3. Coordinate laying of masonry with installation of lateral support specified in this Section and as provided by Section 05500.

3.2.26. **Cavity Walls**

3.2.26.1. Bond cavity wall wythes with joint reinforcement.
3.2.26.2. Where exterior walls change direction, fill cavity solid with cavity sealer for full height of wall. Set sealer in mortar bed and butter with mortar in contact with masonry wythe which is laid later. Install cavity sealer to ensure that it is secured in place and that it completely separates one cavity space form another by an airtight seal.
3.2.26.3. Keep cavity space completely free of mortar. Keep space free by drawing up a wood board the width of the cavity as masonry is laid. Alternatively, omit masonry units in bottom course at approximately 1 m.o.c. to provide access holes for visual inspection of bottom of cavity after wall has been completed. If inspection reveals an accumulation of mortar droppings, clean out cavity through access holes. Install omitted masonry units with joints filled with mortar when approval is given that cavity space is clear of mortar.
3.2.26.4. Install weep holes in vertical joints at 600 mm o.c. in courses immediately above flashings, or at bottom of cavities, or as otherwise may be suitable to ensure that weep holes provide drainage of the cavity space.

3.2.27. **Through Wall Flashings**

3.2.27.1. Install flashing at locations indicated on Drawings.
3.2.27.2. Place flashing over sheet metal for support.
3.2.27.3. Coat surface of flashing in contact with masonry with two coats of adhesive.
3.2.27.4. Lap joints between lengths of flashing a minimum of 100 mm and seal with adhesive.

3.2.28. **Penetration of Masonry**

3.2.28.1. Fill voids of masonry to within 19 mm of structural members, pipes, ducts and conduit that penetrate masonry walls and partitions, unless otherwise indicated.
3.2.28.2. Keep masonry units similarly clear of such penetrations.
3.2.28.3. Finish mortar smooth at face of masonry.
3.2.28.4. 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.

3.2.29. **Shrinkage Control Joints**

3.2.29.1. Incorporate vertical shrinkage control joints in walls of which concrete masonry units are a part.
3.2.29.2. 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 walls with no openings, at a maximum spacing of 10.5 m o.c. Carry joints full height of walls.
3.2.29.3. 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 07920.

3.2.29.4. 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. Maintain separation between walls on each side of joint by installation of continuous building paper between concrete key and block on one side of joint.

3.2.30. **Expansion Joints**

3.2.30.1. Incorporate expansion joints in walls where indicated on Drawings.
3.2.30.2. Build in metal bellows with joints between lengths lapped a minimum of 50 mm and flanges anchored in joint between wythes.
3.2.30.3. 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.
3.2.30.4. Leave clean space in joints for caulking as specified in Section 07920.

3.2.31. **Fire Separations**

3.2.31.1. Construct fire separation walls tightly to construction at perimeter, and without openings or voids.
3.2.31.2. Do not reduce the thickness of masonry fire separations to less than the thickness indicated for the required fire separation rating.

3.2.32. **Fire Protection**

3.2.32.1. Install masonry fire protection of structural steel columns as indicated on Drawings, for fire ratings indicated.
3.2.32.2. Completely enclose structural steel columns with masonry for their entire length. Do not fill webs.

3.2.33. **Grouted Reinforced Masonry**

3.2.33.1. Incorporate reinforcing steel and construct masonry to meet specified requirements of CAN/CSA-A371-M84 and CAN/CSA-S304-M84, and as indicated on Structural Drawings.

3.3. Field Quality Control

3.3.1. An inspection and testing company will be selected to inspect and report on masonry installed by this Section as required by jurisdictional authorities and as directed.

3.3.2. The inspection and testing company will inspect and report on compressive strength of mortar samples as laying of masonry progresses. Provide six 50 mm cubes of mortar from samples taken randomly at the site, for each test, as directed.

3.3.3. Payment for inspection and testing will be made from cash allowance specified in Section 01020.

3.4. Adjustment and Cleaning

3.4.1. Patch damaged masonry walls which have been rejected.

3.4.2. Point all holes in mortar joints except weepholes.

3.4.3. Point all voids in concrete unit masonry faces.

3.4.4. Cut out defective mortar joints to a minimum depth of 13 mm and repoint.

3.4.5. Wash down and brush masonry to remove mortar and stains. Use only detergents, or proprietary masonry cleaners as recommended by brick manufacturer.

3.4.6. Clean concrete masonry units with brushes and as otherwise recommended by the supplier to remove mortar and stains.

3.4.7. Do not use wire brushes for cleaning.

3.4.8. Should specified cleaning methods be insufficient, proceed with other methods only with approval.

3.4.9. Protect adjacent materials, construction and finished surfaces from damage while cleaning.

3.4.10. Ensure that all efflorescence and mortar deposits are removed from surfaces to receive coating.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section

Section 04200: To install loose lintels, shelf angles.

1.1.3. Installation of work which shall be supplied by this Section is specified in:

Section 03300: To install anchors, bolts, floor frames, post sleeves, in slabs.
Section 04200: To install anchors, bolts and inserts in unit masonry.

1.2. Quality Assurance

1.2.1. Subcontractor Qualifications

1.2.1.1. Provide metal fabrications specified in this section only by a fabricator who has adequate plant, equipment, and skilled tradesmen to fabricate and install metal fabrications expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past five years.

1.2.2. Welder Qualifications

1.2.2.1. Weld structural components: in steel, to conform to requirements of CSA Standard W59, and by a fabricator fully certified by the Canadian Welding Bureau to conditions of CSA Standard W47.1 and W55.3: in aluminum by a fabricator fully certified by the Canadian Welding Bureau to requirements of CSA Standard W47.2: as applicable.

1.2.3. Requirements of Regulatory Agencies

1.2.3.1. Metal fabrications which function to resist forces imposed by dead and live loads shall conform to requirements of jurisdictional authorities.
1.2.3.2. Submit shop drawings to authorities if required
1.2.3.3. Construct frames for fire rated doors in accordance with validating label requirements.

1.3. References

1.3.1. Reference Standards

1.3.1.1. Reference Standards quoted in Contract Documents refer to:
1.3.1.2. ASTM A276, Specification for Stainless and Heat-Resisting Steel Bars and Shapes.
1.3.1.3. ASTM A366-72, Specification for Steel, Carbon, Cold Rolled Sheet, Commercial Quality.
1.3.1.4. ASTM A780-80, Standard Practice for Repair of damaged Hot Dip Coatings.

1.3.1.5. CGSB Specification 1-GP-40M, Primer, Structural Steel, Oil Alkyd Type.
1.3.1.6. CGSB Specification 1-GP-108M, Paint, Acid and Alkali Resistant, Black.
1.3.1.7. CGSB Specification 1-GP-132M, Primer, Zinc Chromate, Low Moisture Sensitivity.
1.3.1.8. CGSB Specification 1-GP-181M, Coating, Zinc Rich, Organic Ready Mix.
1.3.1.9. CAN/CSA-G40.20/G40.21-M92, General Requirements for Rolled or Welded Structural Quality Steel
1.3.1.10. CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
1.3.1.11. CSA Standard W47.1-92, Certification of Companies for Fusion Welding of Steel Structures
1.3.1.12. CSA Standard W55.3-1965, Resistance Welding Qualification Code for Fabricators of Structural Members used in Buildings.
1.3.1.13. CSA Standard W59-M1989, Welded Steel Construction (Metal Arc Welding)

1.4. Submittals

1.4.1. Shop Drawings

1.4.1.1. Submit shop drawings.

1.4.2. Samples

1.4.2.1. Submit samples of materials, finishes, and typical sections of items as requested by the Architect.

1.5. Delivery, Storage, and Handling

1.5.1. Label, tag, or otherwise mark metal fabrications supplied for installation by other sections to indicate their function, location in building, and shop drawing designation.

1.5.2. Protect metal fabrications from damage during delivery, storage, and handling.

1.5.3. Deliver metal fabrications to location at building site designated by Contractor and to meet requirements of construction schedule.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. General

2.1.1.1. Unless detailed or specified otherwise, standard products will be acceptable in construction details and installation to meet intent of drawings and specifications.
2.1.1.2. Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of metal fabrications specified in this section.
2.1.1.3. Incorporate only metals that are free from defects which impair strength or durability, or which are visible. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharply defined profiles.
2.1.1.4. Refer to Section 01010 for general fastening requirements.

2.1.2. **Metals**

2.1.2.1. Steel, Structural Shapes, Plate, Bars: Hot-rolled to meet specified requirements of CAN/CSA-G40.21-M81, Grade 300W.
2.1.2.2. Steel, Hollow Structural Sections: Hot Formed, seamless, to meet specified requirements of CAN/CSA-G40.21-M92, Grade 350W, Class H.
2.1.2.3. Steel, Sheet: Cold rolled, stretcher levelled, fully pickled, to meet specified requirements of ASTM Specification A366 or SAE Specification 1010.
2.1.2.4. Stainless Steel: Type 304 (18-8), to meet specified requirements of ASTM A276 for bars, shapes and mouldings.

2.1.3. **Finishes**

2.1.3.1. Prime Paint on Steel: To meet specified requirements of CGSB Specifications 1-GP-40 for oil alkyd type structural steel primer, 1-GP-48 for alkyd metal primer and 1-GP-132 for zinc chromate primer as applicable for specified finish treatments. Refer to Section 09900.
2.1.3.2. Zinc Rich Paint: To meet specified requirements of CGSB Specification 1-GP-181.
2.1.3.3. Galvanizing: For hollow metal brackets, rain water leaders, overhead door jambs, and bent plate sections - 0.61 kg/sq.m. zinc coating to meet specified requirements of ASTM Specification A120; for irregular sections, zinc coating to meet specified requirements of CSA Standard G164, including Appendix A; unless otherwise indicated.

2.1.4. **Fastenings**

2.1.4.1. Steel, cadmium plated screws and bolts.
2.1.4.2. Stainless steel, Austenitic 300 series.
2.1.4.3. Aluminum, screws and bolts, AA2024 or 6061, and nuts, AA6262.

2.1.5. **Anchors**

2.1.5.1. Where exposed to view; to match metal anchored. Stainless steel may be also used with aluminum.
2.1.5.2. Where concealed from view; as for exposed anchors, except that galvanized steel may also be used if electrolytic action would not result.

2.1.6. **Bituminous Paint**

2.1.6.1. Alkali resisting to meet specified requirements of CGSB Specification 1-GP-108.

2.2. Fabrication

2.2.1. **General**

2.2.1.1. Fabricate metal fabrications specified in this section with machinery and tools specifically designed for the intended manufacturing processes and by skilled tradesmen.
2.2.1.2. Fit and assemble metal fabrications in shop. When this is not possible make a trial shop assembly.

2.2.1.3. Incorporate anchors at 600 mm o.c. for metal fabrications located in cast-in-place concrete.
2.2.1.4. Incorporate means for fastening of other installations secured to metal fabrications.

2.2.2. **Construction**

2.2.2.1. Fabricate metal fabrications with materials, component sizes, metal gauges, reinforcing, anchors, and fasteners of adequate strength to withstand intended use, and within allowable design factors imposed by jurisdictional authorities.
2.2.2.2. Ensure that metal fabrications will remain free of warping, buckling, opening of joints and seams, distortion, and permanent deformation.
2.2.2.3. Construct items that are part of floor constructions, such as loads for which surrounding floors are designed unless indicated otherwise.
2.2.2.4. Ladders shall support at the centre of their treads or rungs a concentrated minimum load of 1.33 kN.

2.2.3. **Assembly**

2.2.3.1. Accurately cut, machine, and fit joints, corners, copes, and mitres so that junctions between components fit together tightly and in true planes.
2.2.3.2. Conceal fastenings from view unless otherwise indicated on drawings.
2.2.3.3. Weld all connections where possible; bolt where not possible, and cut off bolts flush with nuts. Countersink bolt heads, and provide method to prevent loosening of nuts. Ream holes drilled for fastenings.
2.2.3.4. Weld joints tight, flush, and in true planes with base metals. Make welds continuous at joints where entry of water into building, or into voids of members or assemblies is possible.
2.2.3.5. Grind welds smooth where exposed to view.
2.2.3.6. Provide for differential movements within assemblies and at junctions of assemblies with surrounding construction.

2.2.4. **Finish Work**

2.2.4.1. Incorporate holes and connections for products installed under other sections of the specifications.
2.2.4.2. Cleanly and smoothly finish exposed edges of materials including holes.
2.2.4.3. Cap open ends of sections exposed to view, such as pipes, channels, angles, and other similar members.
2.2.4.4. Machine or grind components to ensure level bearings.

2.2.5. **Prime Painting of Steel**

2.2.5.1. Clean all loose mill scale, rust, dirt, weld flux and spatter from work after fabrication. Grind smooth sharp projections. Unless otherwise specified apply to steel surfaces a shop prime coat of paint. Force paint into corners and cover open areas smoothly with a uniform coating. Deliver metal fabrications to site with primer undamaged. Paint all surfaces except those to be welded in field, encased in concrete, or that are machined or galvanized. Give surfaces that are inaccessible to finish field painting two coats of primer.
2.2.5.2. Paint steel members under cover in shop and keep them under cover until paint has dried.

2.2.6. **Galvanized Steel**

2.2.6.1. Hot dip galvanize assemblies following their fabrication except where impossible.
2.2.6.2. Fabricate items to be galvanized as recommended in Appendix A and Appendix B of CSA Standard G164.
2.2.6.3. Paint galvanized surfaces that are cut, welded, or threaded with zinc rich paint to ensure a minimum coating thickness of 0.102 mm, immediately following damage to galvanized protection. Prepare and repair surfaces to meet specified requirements of ASTM Specification A780.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Take site measurements to ensure that metal fabrications fit surrounding construction, around obstructions and projections in place, or as shown on drawings, and to suit service locations.

3.2. Installation

3.2.1. Install metal fabrications plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding construction.

3.2.2. Provide anchor bolts, bolts, washers and nuts, lag screws, expansion shields, toggles, straps, sleeves, brackets, clips, and other items necessary for secure installation of metal fabrications as required by loading and jurisdictional authorities.

3.2.3. Countersink holes provided for wood screws where wood is attached to metal fabrications.

3.2.4. Attach metal fabrications to masonry with lead plugs and galvanized steel or other corrosion resistant fastenings to support load with a safety factor of three.

3.2.5. Insulate between dissimilar metals; or between metal, and masonry or concrete with bituminous paint to prevent electrolysis.

3.2.6. Caulk between components installed by this section to seal joints against passage of air or water, or both. Section 07920 includes caulking between metal fabrications and adjoining construction.

3.2.7. Grout metal posts, pickets, balusters, and the like, in metal sleeves cast into concrete, with sulphur, molten lead or quick setting anchor cement, unless detailed otherwise. Fabricate sleeves of 150 mm minimum depth.

3.3. Adjustment and Cleaning

3.3.1. After erection, touch up primed surfaces that are burned, scratched, or otherwise damaged with prime paint to match shop coat.

3.3.2. Repair areas of bare metal and welds on galvanized surfaces with zinc rich paint.

3.3.3. Remove damaged, dented, defaced, defectively finished, or tool marked components and replace with new.

3.3.4. Refinish shop applied finishes in field only with approval.
3.3.5. Clean off dirt on surfaces resulting from installation.

3.4. Protection

3.4.1. Maintain protection of metal fabrications from time of installation until final finishes are applied or to final cleanup.

3.4.2. Protect prime painted, galvanized surfaces from damage.

3.4.3. Protect exposed surfaces of prefinished metal which does not receive site finishing with protective coatings or wrappings. Use materials recommended by finishers or manufacturers of metals to ensure that method is sufficiently protective, easily removed, and harmless to the finish.

3.5. Schedule of Metal Fabrication

3.5.1. General

3.5.1.1. Ensure that all drawings and specifications sections, including those for structural, mechanical, and electrical work, are consulted to establish the limits of metal fabrication installations included in this section.

3.5.2. Loose Lintels and Shelf Angles

3.5.2.1. Refer to S101 for Structural Steel Lintels.
3.5.2.2. Refer to detail 1/S101 and schedules 5.01 and 5.01b
3.5.2.3. Coordinate quantities with section 04200
3.5.2.4. Predrill new brick support steel. Refer to detail 1/S101.
3.5.2.5. Finish: galvanized for detail 1/S101brick support.
3.5.2.6. All other metal prime coated.

3.5.3. Garbage Enclosure Gate Posts and Bollards

3.5.3.1. Fabrication of 100mm x 150mm hollow steel section and 4.5mm thick steel cap and of length to suit detail.
3.5.3.2. Provide masonry strap anchors, 25mm wide, 200mm long on one side of tube spaced at 200mm on centre and horizontal bars at 300mm on centre for foundation.
3.5.3.3. Welded construction.
3.5.3.4. Prime painted.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Related to This Section Performed by Other Sections

Section 06200: Finish Carpentry

1.1.3. Installation of Work Supplied by This Section, Specified in Other Sections

Section 03300: To install bolts, inserts, etc.
Section 04200: To install bolts, inserts, etc.

1.2. Quality Assurance

1.2.1. Requirements of Regulatory Agencies

1.2.1.1. Mark each piece of wood, which is rated non-combustible by fire retardant pressure treatment, with ULC Fire Hazard Classification label.

1.3. References

1.3.1. Reference Standards

1.3.1.1. Grade lumber in accordance with rules and regulations of the National Lumber Grades Authority.
1.3.1.2. Dimensions of lumber shall conform to dressed sizes specified in CSA Standard O141-91.
1.3.1.3. Reference standards quoted in Contract Documents refer to:

1.3.1.3.1. ASTM E84-81a, Test for Surface Burning Characteristics of Building Materials.
1.3.1.3.2. CAN/CSA O80 Series-M89, Wood Preservation.
1.3.1.3.3. CAN/CSA O141-91, Softwood Lumber.
1.3.1.3.4. CSA Standard B111-1974, Wire Nails, Spikes and Staples.
1.3.1.3.5. CSA Standard O121-M1978, Douglas Fir Plywood.

1.4. Site Conditions

1.4.1. Environmental Conditions

1.4.1.1. When it is required that wood maintain dimensional stability and tolerances to ensure accurate installation of later work, store and install it only in dry areas, and where no further installation of moist materials is contemplated.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. For lumber and fastenings conform to Ontario Building Code, Section 4.3.

2.1.2. Grade mark lumber by the appropriate association under authority of the National Lumber Grades Authority.

2.1.3. Moisture content of lumber at time of building-in shall not exceed 19%.

2.1.4. **Lumber**

2.1.4.1. Spruce-Pine-Fir Species Group Designation, framing lumber, with no more than 15% of next lesser of specified grade included.
2.1.4.2. For utility use where concealed: sound and free of imperfections or deficiencies making unsuitable for use.

2.1.5. **Plywood**

2.1.5.1. Douglas Fir, in conformance with CSA Standard 0121-M1978.
2.1.5.2. For utility use: Unsanded Sheathing Grade.

2.1.6. **Nails, Spikes and Staples**

2.1.6.1. In conformance with CSA Standard B111-1974; galvanized at exterior locations, at interior high humidity locations and for treated lumber; plain finish elsewhere. Use spiral shank nails generally.

2.1.7. **Fasteners**

2.1.7.1. To hollow masonry use toggle bolts: to solid masonry and concrete use expansion shields and lag bolts; to steel use bolts or welded stud fasteners. Use lead or inorganic fibre plugs for fasteners in concrete and masonry. Provide washers at bolt heads and nuts. Galvanize fasteners at exterior locations, at high humidity interior locations and for treated lumber.

2.1.8. **Wood Preservative**

2.1.8.1. Copper naphthenate or pentachlorophenol solution to meet specified requirements of CSA Standard O80.

2.1.9. **Dampproof Membrane**

2.1.9.1. 0.051 mm polyethylene film.

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section

Section 06100: Rough Carpentry
Section 06410: Casework
Section 09900: Painting & Finishing

1.1.3. References

1.1.3.1. Conform to CSA Standard 0141-91 for dressed dimensions of wood members.

1.1.3.2. Reference standards quoted in Contract Documents refer to:

- 1.1.3.2.1. ASTM E84-81a, Test for Surface Burning Characteristics of Building Materials.
- 1.1.3.2.2. CAN3-O188.1-M78, Interior Mat-Formed Wood particleboard
- 1.1.3.2.3. CAN/CSA-A172-M79, High Pressure, Paper Base, Decorative Laminates
- 1.1.3.2.4. CAN/CSA-O80 Series-M89, Wood Preservation
- 1.1.3.2.5. CAN/CSA-O141-91, Softwood Lumber
- 1.1.3.2.6. CSA Standard O115-1982, Hardwood Plywood
- 1.1.3.2.7. CSA Standard O121-M1978, Douglas Fir Plywood
- 1.1.3.2.8. CSA Standard O151-M1978, Canadian Softwood Plywood
- 1.1.3.2.9. CSA Standard O153-M1980, Poplar Plywood
- 1.1.3.2.10. CGSB Specification 11-GP-3M, Hardboard

1.1.3.3. Fabricate millwork as specified in Finish Carpentry Schedule to meet specified requirements of Custom Quality Standard of either:

- 1.1.3.3.1. : AWI Specification, Architectural Woodwork Quality Standards and Guide
- 1.1.3.3.2. Specifications, 1973, by Architectural Woodwork Institute, or
- 1.1.3.3.3. : AWMAC Specification, Quality Standards for Architectural Woodwork of the
- 1.1.3.3.4. Architectural Woodwork Manufacturers Association of Canada, Seventh Edition, 1984.

1.1.4. Submittals

1.1.4.1. Shop Drawings

1.1.4.1.1. Submit detailed shop drawings of all millwork and finished carpentry items.

1.1.5. Samples

1.1.5.1. Submit samples of each specified finish wood species, and in each cut if requested.

1.1.6. **Delivery, Storage and Handling**

1.1.6.1. Protect materials from damage during handling, delivery, and storage.
1.1.6.2. Receive finish hardware supplied by Section 08710 and store, secure against theft.
1.1.6.3. Do not deliver wood materials to site until storage areas are completed, and conditions are such that no damage will occur to them while in storage and during installation.

1.1.7. **Site Conditions**

1.1.7.1. **Environmental Requirements**

1.1.7.1.1. Ensure that relative humidity in areas where wood materials are stores and installed does not exceed 55%.

1.1.8. **Warranty**

1.1.8.1. **Extended Warranty**

1.1.8.1.1. Warranty installation specified in this Section covering the period for one (1) year beyond the expiration of the warranty period specified in the General Conditions to the Contract.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. **General**

2.1.1.1. Provide rough hardware required for finish carpentry specified in this Section. Use non-corrosive hardware at exterior locations.
2.1.1.2. Moisture content of wood at time of installation shall be for interior locations at an average of 7%, with a permitted range of individual pieces of 5% to 9%; and for exterior locations at an average of 12%, with a permitted range in individual pieces of 10% to 15%.
2.1.1.3. Use only adhesive and fastenings that develop sufficient strength for intended use, are non staining, and are unaffected by the environment to which exposed.

2.1.2. **Wood**

2.1.2.1. Grade mark softwood and hardwood lumber by the appropriate association under authority of the National Lumber Grades Authority.
2.1.2.2. Where not exposed to view, use wood of grades suitable for fabrication, utility and structural needs.
2.1.2.3. Where exposed to view, use Appearance Grade wood for structural lumber, as otherwise specified. Meet requirements of specified AWI or AWMAC Quality Grade Standard, where applicable.
2.1.2.4. Ensure that surfaces exposed to view and given a natural or stained finish are free from markings and stains caused by milling, treatment, storage, handling and other causes.

2.1.2.5. Ensure that veneered panels, and solid finger jointed and edge laminated members, where admissible for incorporation as approved, are matched for grain configuration and uniformity of colour throughout all surfaces exposed to view which are to receive a natural or stained finish.

2.1.3. **Plywood**

2.1.3.1. Douglas Fir; To meet specified requirements of CSA Standard O121-M1978; Sanded Grade, Good Two Sides where both sides are exposed to view, and Good One Side where only one side is exposed to view.

2.1.3.2. Softwood: To meet specified requirements of CSA Standard O151-M1978, Sanded Grade, Solid Two Sides where both sides are exposed to view, and Good One Side where only one side is exposed to view.

2.1.3.3. Hardwood: To meet specified requirements of CSA Standard O115-M1978 veneer core, Type II, smooth sanded, rotary cut face veneers, Good Grade where exposed to view and Sound Grade where not.

2.1.3.4. Poplar: To meet specified requirements of CSA Standard O153-M1980.

2.1.3.5. Birch: Rotary cut Select Grade veneer where transparent or clear finish specified.

2.1.4. **Particleboard**

2.1.4.1. To meet specified requirements of CAN/CSA-O188.1-M78, Grade S.

2.1.5. **Plastic Laminate**

2.1.5.1. To meet specified requirements of CAN/CSA-A172-M79.

2.1.5.2. Colour: Selected from manufacturer's standard solid colour range.

2.1.6. **Hardboard**

2.1.6.1. To meet specified requirements of CGSB Specification 11-GP-3, Type 2.

2.1.7. **Fire Retardant Treatment**

2.1.7.1. Pressure treat lumber in accordance with CSA Specification O80 Series-M89, C20 and plywood with O80 Series-M89 C27, or to ULC Specifications; to ensure a flame spread rating of less than 25 when tested in accordance with ASTM Standard E84.

2.1.8. **Wood Preservative**

2.1.8.1. Clear pentachlorephenol, to meet specified requirements of CSA Standard O80 Series-M89.

2.2. Fabrication

2.2.1. **General**

2.2.1.1. Assemble fabricated millwork units in mill in units as large as possible. Design units to fit together if site assembly is required.

2.2.1.2. Edge plywood where specified or indicated with solid wood to match face veneer, with profiled pressure glued edge joint and finished level with plywood surfaces.

2.2.1.3. Fabricate custom casework specified in this Section to meet workmanship specifications in Section 400, Casework, of AWI/AWMAC Custom Quality Standard, except as modified, and as follows:

2.2.1.3.1. Conceal edge grain of exposed and semi-exposed plywood and particleboard using solid hardwood edges for stain finish or plastic laminate.

2.2.1.3.2. Assemble cabinet body members with adhesive.

2.2.1.3.3. Where permitted, drive power-driven Tee head nails or staples with long dimension parallel to grain.

2.2.1.3.4. Install dust panels between drawers.

2.2.1.4. Shop fabricate work of this Section in as large units as possible.

2.2.1.5. Incorporate services, fixtures, and trim in units as indicated on drawings or specified in Divisions 15 or 16, or both. Make all necessary cutouts to template information.

2.2.2. **Trim**

2.2.2.1. Rout or groove backs of flat trim members.

2.2.2.2. Kerf backs of wide flat member.

2.2.3. **Fastening**

2.2.3.1. Fasten assemblies with nails generally, but use screws or special fasteners at critical joints where strain, and excessive usage and shrinkage are anticipated, and where required by specified quality grade standards.

2.2.3.2. Glue built-up assemblies as well as nailing and screwing.

2.2.3.3. Bind nail unless impossible.

2.2.3.4. Set finish nails below finished surfaces.

2.2.4. **Plastic Laminate Facing**

2.2.4.1. Apply plastic laminate for counters to poplar faced phenolic bonded plywood, or to particleboard, minimum 19 mm thick, or as otherwise indicated on Drawings. Apply plastic laminate for doors, drawer fronts, gables, etc. of cabinets to minimum 19 mm thick wood core, Birch faced plywood.

2.2.4.2. Bond plastic laminate to backing with urea formaldehyde adhesive, or by methods of equal or better quality recommended by the plastic laminate manufacturer.

2.2.4.3. Seal edges of cutouts with plastic laminate, or where concealed from view by other methods that will prevent entry of moisture into core.

2.2.4.4. Apply plastic laminate backing sheet to core on back side of panels faced with plastic laminate.

2.2.4.5. Ensure that both face and backing sheet have been sanded in same direction.

2.2.4.6. Bond plastic laminate self-edges under pressure, and bevel and finish smooth finished corners.

2.2.4.7. Round corners of holes cut through plastic laminate and file them smooth.

2.2.4.8. Make joints only when lengths of plastic laminate facing exceed 3660 mm. Butt joints together, reinforce core with 6.4 mm hardwood blind splines, and lock together with Tite Joint fasteners located at a maximum of 75 mm from edges.

2.2.5. **Finishing**

2.2.5.1. Finish each surface of millwork to specified quality grade standard where exposed or semi exposed. Consider that all visible surfaces are exposed, including underside surfaces above 1200 mm from floor and interiors of fitments behind glass doors. Consider that underside surfaces within 1200 mm of the floor, top surfaces more than 1800 mm above the floor, interiors of fitments behind opaque doors and the backs of fitment doors are semi-exposed.

2.2.5.2. Fine sand surfaces level and smooth after fabrication.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Before commencing installation, ensure that grounds, strapping, and other constructions and surfaces to which finish carpentry is installed are satisfactory for fitting and adequate for its securement.

3.1.2. Take site measurements of construction to which finish carpentry installations must conform, and through which access must be made, before fabricated units are delivered to site, to ensure that adaptation is not required which would result in construction delay.

3.2. Preparation

3.2.1. **Protection**

3.2.1.1. Ensure that finish carpentry materials are protected from damage and deterioration during installation, and otherwise until project completion in accordance with General Conditions.

3.2.1.2. Take particular care that wood made fire retardant by pressure treatment is not exposed to dampness.

3.3. Installation

3.3.1. **General**

3.3.1.1. Backprime exterior and interior millwork specified in this Section immediately after delivery to site under work of Section 09900. Ensure that cut ends are primed. Scrape or sand smooth surfaces by this Section. Notify those who are responsible for backpriming in sufficient time to enable them to schedule their work.

3.3.1.2. Coordinate the installation of casework manufactured under section 06410 and determine which section will be responsible for the installation of casework. Notify the architect of section responsibility for installation of casework.

3.3.1.3. Install finish carpentry plumb, level and straight, and fasten it securely to backing to support itself and anticipated superimposed loads.

3.3.1.4. Build finish carpentry into construction as indicated on Drawings or specified in other Section of the Specifications, or both.

3.3.2. **Trim**

3.3.2.1. Install in single lengths except where material limitation makes impossible. Stagger joints where they occur and locate over solid backing for fastening.
3.3.2.2. Install wood bases after finish flooring is laid.
3.3.2.3. Cut returns of stool and apron ends to match face profile.

3.3.3. **Cutting and Fitting**

3.3.3.1. Cut moldings with sharp true profiles.
3.3.3.2. Cope trim and mouldings at interior corners and at returns.
3.3.3.3. Miter trim and mouldings at exterior corners. Glue and lock shop miters that are over 100 mm from heel to point.
3.3.3.4. Scribe and join members accurately together, and to other surfaces, to fit tightly and with flat smooth surfaces. Install trim or filler panels to close gaps.
3.3.3.5. Ensure that all cutouts for electrical devices and plumbing are fully coordinated and neatly completed for work under this section and Section 06410.

3.3.4. **Fastening**

3.3.4.1. Fasten finish carpentry with nails generally, but use screws or special fasteners at critical joints where strain, usage and excessive shrinkage is anticipated, and where specified quality grade standards require.
3.3.4.2. Blind nail unless impossible.
3.3.4.3. Set finish nails below finished surfaces to receive putty.

3.3.5. **Installation of Doors**

3.3.5.1. Install wood doors after finishing of walls.
3.3.5.2. Fit wood doors with 2 mm clearance at jambs and heads, and 9.5 mm over finished flooring.
3.3.5.3. Trim hinge side of wood doors to fit, and bevel latch edges as required.
3.3.5.4. Ensure that top and bottom edges of wood doors are primed under Work of Section 09900 after they are cut to fit.
3.3.5.5. Undercut wood doors where indicated on Door Schedule.

3.3.6. **Installation of Finish Hardware**

3.3.6.1. Install finish hardware
3.3.6.2. Make cuts in wood doors neatly
3.3.6.3. Accurately locate and adjust hardware to meet manufacturer's instructions. Use special tools and jigs as recommended.
3.3.6.4. Install hardware in wood doors at same locations as for hollow metalwork installed in project.
3.3.6.5. Locate door stops to contact doors 75 mm from latch edge.
3.3.6.6. Install hardware and trim square and plumb to doors.
3.3.6.7. Replace missing hardware to ensure specified installation at time of building completion.
3.3.6.8. After installation, replace wrappings for hardware provided by manufacturer.

3.3.6.9. Safeguard keys to keep them out of unauthorized hands, tag them with opening number, and deliver them to person designated by Architect at building completion.

3.3.7. **Finishing**

3.3.7.1. Sand wood surfaces after installation to leave surfaces in true planes and free of machine or tool marks.

3.3.8. **Wood Preservative**

3.3.8.1. Give wood installed at exterior of building and which is specified for painting a soaking coat of wood preservative on all surfaces. Give freshly cut ends two additional soaking coats.

3.4. Adjustment and Cleaning

3.4.1. Adjust hinged doors to swing freely and easily, to remain stationary at any point of swing, to close evenly and tightly against stops without binding, and to latch positively when doors are closed with moderate force. Ensure that when doors are installed with hinged stiles adjacent, both doors can open simultaneously without binding.

3.4.2. Adjust hardware so that latches and locks operate smoothly and without binding, and closers act positively with the least possible resistance in use. Lubricate hardware if required by supplier's instructions.

3.4.3. Clean hardware after installation in accordance with supplier's instructions.

3.4.4. Sand and clean woodwork to leave free from finish defects in any exposed part.

End of Section

PART 3 - EXECUTION

3.1. Installation

3.1.1. General

3.1.1.1. Lay out items installed by this Section carefully and to accommodate requirements of other Sections. Cut and fit members accurately; erect them in position indicated by Drawings; align, level, square, plumb, and secure them permanently in place. Brace work temporarily as required. Join members only over solid backing.

3.1.1.2. Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates and lag screws tightly when installed, and again just before being concealed by other installations or at completion of the work.

3.1.1.3. Cooperate with other Sections to ensure that unity of actions will ensure orderly progress to meet construction schedule.

3.1.1.4. Supply anchors, bolts, and inserts, required for installations of this Section, to those performing the work of other Sections and who are responsible for their installation.

3.1.1.5. Include rough hardware such as nails, bolts, nuts, washers, screws, clips, hangers, connectors, and strap iron required for installations by this Section; and for all operating hardware required by this Section for temporary use.

3.1.1.6. Do not attach installations of this Section by wood plugs or blocking in concrete or masonry. Use lead shields, expansion shields, concrete nails, or similar methods only as approved.

3.1.2. Blocking, Nailers, Strapping, Furring, Grounds & Miscellaneous Rough Framing

3.1.2.1. Do not regard nailers, blocking, and such other fastening provisions as shown on drawings as exact or complete. Install required provisions for fastening, located and secured to suit site conditions, and adequate for intended support.

3.1.2.2. Cut members into lengths as long as practicable and with square ends.

3.1.2.3. Install rough bucks for opening jambs, heads, and sills of minimum nominal 38 mm thickness, and of width of casings or as otherwise indicated. Set bucks plumb, level, and anchored securely in place.

3.1.2.4. Verify that grounds required for fastening of components and equipment are located correctly, and that they provide adequate support.

3.1.2.5. For general strapping, set preservative treated nominal 19 mm x 38 mm wood strips vertically and spaced at 400 mm o.c., unless otherwise indicated. Shim to provide a true face plane. Install intermediate horizontal strapping at all joints to wall finishes applied over grounds.

3.2. Adjustment

3.2.1. Ensure that bolted fasteners are drawn up tightly.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section is Specified in

Section 04200: Unit Masonry
Section 07215: Cavity Wall Insulation
Section 07550: Protected Membrane Roofing

1.1.3. This Section Specifies Work Which Shall be Performed by

Section 03300 - Cast-In-Place Concrete
Section 04200 - Unit Masonry
Section 07520 - Bitumen Membrane Roofing
Section 07600 - Flashing and Sheet Metal
Section 07920 - Sealants and Caulking
Section 08520 - Aluminum Windows
Section 09250 - Gypsum Board

1.2. System Description

1.2.1. Air Barrier Retention Requirements

1.2.1.1. Provide an air barrier to ensure that air is prevented from exfiltration and infiltration between the interior and exterior of the building through exterior wall and roof constructions.
1.2.1.2. Prevent exfiltration and infiltration under all conditions of air pressure differentials resulting from mechanical systems of the building, and barometric pressure and wind forces within limits specified and as imposed by jurisdictional authorities.

1.2.2. Vapour Permeance Requirements

1.2.2.1. Incorporate barriers in construction envelope to ensure that air leakage, and water vapour permeance in excess of 0.025 perms, is prevented through them. Seal each crack, joint and penetration by other components with self-adhesive vapour barrier tape to maintain integrity of barrier.
1.2.2.2. **Interface with Adjacent Systems**
1.2.2.3. Coordination between all installers of components of the air barrier system is essential to ensure continuity of the barrier and that junctions between the various components are effectively sealed.
1.2.2.4. Verify with Architect, installation procedures of building products incorporated into air barrier elements including but not limited to, various barrier membranes, sheet metal closers, and sealants as well as continuity with roofing membrane where applicable.

1.3. Quality Assurance

1.3.1. Requirements of Regulatory Agencies

1.3.1.1. Install only vapour barrier material with an inherent fire hazard classification in all its parts that is within limits established by jurisdictional authorities.
1.3.1.2. Validate fire hazard classification only by testing laboratories acceptable to jurisdictional authorities.
1.3.1.3. Attach Underwriters' Laboratories labels to packages of fire rated materials.

1.3.2. Mock-Up

1.3.2.1. Install air barrier membrane for mock-up specified in Section 04200.

1.4. References

1.4.1. Reference Standards

1.4.1.1. Reference Standards quoted in Contract Documents refer to:
1.4.1.2. ASTM A525-81, Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, General Requirements.
1.4.1.3. CAN/CGSB-51.33-M80, Vapour Barrier, Sheet, for Use in Building Construction.

1.5. Submittals

1.5.1. Samples

1.5.1.1. Submit 216 mm X 280 mm samples of membranes.

1.5.2. Affidavits

1.5.2.1. Submit affidavits from vapour retarder and air barrier manufacturers that products meet specified vapour retardation, air barrier requirements if requested.

1.6. Delivery, Storage and Handling

1.6.1. Package vapour barrier materials and label them to designate manufacturer and type.

1.6.2. Store materials in dry areas, protected from wetting and traffic.

1.6.3. Ensure that sealants and joint sealing tape are stored at a minimum temperature of 4°C for 12 hours before installation, and that freezable adhesives are stored only at temperatures above 0°C at all times.

1.6.4. Do not store air barrier membrane materials in areas with temperatures above 38°C.

1.7. Site Conditions

1.7.1. Environmental Requirements

1.7.1.1. Do not apply membrane or system components when surface or ambient air temperatures are below 5°C.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Vapour Retarder

1.1.1.1. Vapour Retarder Membrane Type 1, to meet specified requirements of CAN/CGSB-51.33-M80.
1.1.1.2. Vapour Retarder Adhesive to be suitable for installation conditions and with perm rating providing vapour retardation equal to or better than for Type 1 membrane specified in CAN/CGSB-51.33-M80.

2.1.2. Air Seal Barrier Generally

2.1.2.1. When design intent and another material is not indicated typically on Drawings, and where approved by Architect, an air seal barrier may be provided by, but not limited to, the following:
: roofing membrane
: glass
: poured dense concrete
: metals
: suitable sealants
: suitable reinforced asphalt or plastic membranes
2.1.2.2. These materials shall not substitute for a system indicated on Drawings as typical for Project without approval of the Architect.
2.1.2.3. Polyethylene film material when used as a vapour barrier is NOT regarded as being a component of an air seal.
2.1.2.4. Sheet Metal: Galvanized sheet steel to meet specified requirements of ASTM Specification A525, zinc coating designation Z275.
2.1.2.5. Provide air seal barrier sufficient strength to resist forces of wind and air pressure which may act on it. Wind pressure criteria to be established by maximum wind loading requirements of jurisdictional authorities.

2.1.3. Air Barrier Membrane System

2.1.1.1. Membrane: self adhesive, sheet, 1 mm minimum thickness, Sealtight Air-Shield by W. R. Meadows, Perm-A-Barrier by W.R. Grace and Company of Canada, or Blueskin SA by Bakor Inc., or Sopraseal Flam 180 by Soprema or approved alternatives. Exoair 110/110LT by Tremco Canada.
2.1.1.2. Primers, mastics, adhesives, to be of manufacturers' standard compatible with membrane.
2.1.1.3. Membrane width shall be not less than 450 mm to suit masonry ties.

2.1.4. Sealant

2.1.4.1. To meet specified requirements of Section 07920.

2.1.5. **Joint Tape**

2.1.5.1. Dead soft aluminum foil, 0.05 mm thick, 75 mm wide pressure sensitive by Morgan Adhesives Canada Ltd.

2.1.6. **Foam Insulation**

2.1.6.1. One or two part, polyureathane, with a nominal density of 40 kg/cubic meter, coefficient of linear expansion of 0.00006 mm/m/deg C, water vapour transmission of 73 Ng/Pa5sq.m and thermal conductivity of 0.02 W/mdeg,K.
2.1.6.2. Similar to products as produced by BASF Canada Inc.

PART 3 - EXECUTION

3.1. General

3.1.1. **Vapour Retarder**

3.1.1.1. Ensure integrity of vapour barrier perm rating and air barriers are maintained. The extreme care that the barriers are sealed where elements penetrate them, and that they extend across and are sealed at junctions between other parts of the barrier system.
3.1.1.2. Apply vapour barrier to cover face of insulation board toward interior of building, and to form an integral monolithic membrane barrier against water vapour and air penetration. Seal barrier to adjacent barrier systems, and take care that it is not punctured during installation.
3.1.1.3. Secure vapour barrier to furring so that joints are sealed.

3.1.2. **Install Air Seal Barriers to Ensure:**

3.1.2.1. That they are supported, secured in a manner to withstand differential air pressure forces without displacement, loss of air seal properties.
3.1.2.2. That continuity of the air seal barrier system is maintained in the exterior walls and roof enclosing the building.
3.1.2.3. That the air seal is maintained intact at junctions of partitions, stack locations and other components with wall and roof constructing, penetrations of the barrier by other construction components, and by careless installation.

3.1.3. Provide airtight seal at penetrations of vapour and air retarder systems, and at junctions of such systems with other construction.

3.1.4. Where shown on drawings, install foam insulation to ensure continuity of vapour retarder, air barrier and insulation systems. Install in sufficient depths in order to match R value of surrounding wall / window / door / roof system.

3.2. Air Barrier Membrane Installation

3.2.1. **Preparation**

3.2.1.1. Surfaces to receive membrane to be smooth, clean, dry, in good condition. Remove moisture, grease, machine oil, or other foreign materials.

3.2.1.2. Prime surfaces to receive membrane with specified primer either by spraying or by rolling at a rate of 6 to 8 sq.m/L.
3.2.1.3. Prime only surfaces which will be covered by membrane in one day.

3.2.2. **Application**

3.2.2.1. Apply membrane to primed surfaces to suit masonry ties and as recommended by manufacturer. Install while primer is tacky.
3.2.2.2. Roll each sheet of membrane once the sheet is in place.
3.2.2.3. All laps shall be not less than 50 mm.
3.2.2.4. Re-roll laps, joints to ensuring proper seal.
3.2.2.5. Apply a trowelled bead of mastic to termination of day's work.
3.2.2.6. Extend membrane as required to provide overlap to waterproofing and roofing.
3.2.2.7. This Contractor shall provide overlap and seal membrane to roofing membrane as detailed on Drawings. Coordinate with roofing contractor to ensure compatibility of materials and continuity of membranes
3.2.2.8. Extend membrane into door and window opening sufficiently to allow attachment to backup materials, sealing to door and window frames. Mechanically attach membrane to frames.
3.2.2.9. Inside corners to receive fillet made of mastic and 300 mm wide reinforcing membrane.
3.2.2.10. Outside corners shall receive 300 mm wide reinforcing piece of membrane.
3.2.2.11. Gaps or joints wider than 6 mm shall be filled with foam backer rod and then reinforced with 300 mm piece of membrane prior to installation of membrane. Provide for expansion and contraction of structure.
3.2.2.12. Use liquid membrane or adhesive to seal around penetrations.
3.2.2.13. Air barrier membrane is not designed for permanent exposure. Provide temporary covering of tarpaulins if not covered by insulation within one (1) week.

3.3. Field Quality Control

3.3.1. The air seal barrier system will be inspected after installation to verify its total integrity.

3.3.2. Inform the Architect when portions of the system have been installed and before they are covered by other construction or their accessibility for inspection is otherwise impeded.

3.3.3. Arrange to have a technical representative who is familiar with specified products and their installation, on site during application of the materials and to inspect system when completed.

3.4. Adjustment

3.4.1. Examine completed air seal barrier system. Repair & seal all breaks in system to ensure maintenance of its integrity.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section is Specified in:

Section 07190: Vapour Retarder and Air Barrier
Section 09250: Gypsum Board
Section 08100: Hollow Metal Doors and Frames
Section 08900: Aluminum Glazing

1.2. System Description

1.2.1. Thermal Insulation Requirements

1.2.1.1. Incorporate thermal insulation in the construction envelope to ensure a thermal barrier system is maintained in accordance with the requirements of Section 01900.

1.3. Quality Assurance

1.3.1. Requirements of Regulatory Agencies

1.3.1.1. Install only insulation with an inherent fire hazard classification in all its parts that is within limits established by jurisdictional authorities.
1.3.1.2. Validate fire hazard classification only by testing laboratories acceptable to jurisdictional authorities.
1.3.1.3. Attach Underwriters' Laboratories labels to packages of fire rated materials.

1.4. References

1.4.1. Reference Standards

1.4.1.1. Reference standard quoted in Contract Documents refers to:
1.4.1.2. CAN/ULC-S702-97 for Semi Rigid Insulation
1.4.1.3. CSA Standard A101-M1983, Thermal Insulation, Mineral Fibre, for Buildings.
1.4.1.4. CAN/ULC -S701-97, Type 4 for extruded polystyrene.

1.5. Delivery, Storage and Handling

1.5.1. Package insulation materials and label them to meet specified requirements of CSA Standard A101.

1.5.2. Store insulation materials in dry areas, protected from wetting and traffic.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. General: Refer to drawings for thickness of insulation required. Where following the specified list choices of materials, the contractor shall select appropriate products from such lists on the basis of their total compatibility when incorporated into the entire assembly, as well as their ability to adhere to other components permanently and in a rigid manner.

2.1.1.1. Rigid Insulation; perimeter insulation, extruded poly styrene. Dow 'SM' Owens Corning 'Celfort 300'

2.1.1.2. Semi-rigid insulation: mineral fibre, cavity wall insulation. Roxul 'Cavityrock" Owens Corning 'Fibreglas Type 703".

2.1.1.3. Foamed in Place insulation: CFC free polyurethane foam as manufactured by Instafoam, Hilti, or approved alternate.

2.1.2. Mastic adhesive: solvent based polymer modified liquid applied membrane compatible with insulation to be applied, type as manufactured for the attachment of insulation as manufactured by Bakor (airbloc 21) or approved alternate.

2.1.3. Insulation fasteners: soft washer and pin type; direct fasten type; concrete/block back-up/precast: Grey polyethylene washer, corrosion resistant fastener, pin length to suit application as recommended for pin embedment depth as manufactured by Hilti (X-SW 60 Pins) or approved alternate.

2.1.4. Insulation attachment to metal studs: galvanized self tapping screws for 12.7mm minimum embedment into metal studs, complete with 25mm diameter plastic retaining washers.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Before commencing installation of insulation, ensure that framing is installed to suit dimensions of insulation and to ensure proper support.

3.2. Installation

3.2.1. General

3.2.1.1. Do not install insulation in areas of the building unprotected from water, freezing or similar damaging environmental conditions.

3.2.1.2. Fit insulation snug without compression into every void to ensure full thickness for full length of construction, to prevent air movement simultaneously both sides of insulation.

3.2.1.3. Install insulation tightly against interior finish construction, except that when pipes and ducts occurs within wall construction install it between exterior finish construction and the pipes or ducts.

3.2.1.4. Cut and fit insulation tightly around pipes, conduits, outlet boxes and other similar components.

3.2.1.5. Install insulation in one piece for full length of voids. Where this is impossible, join lengths with ends fitted snugly or overlapped.

3.2.1.6. Apply insulation to ensure total and complete coverage of all surfaces to be insulated, and in direct contact with such surfaces.

3.2.2. **Wall Insulation**

3.2.2.1. Ensure that insulation is supported to prevent settlement.
3.2.2.2. Install friction fit batts snugly between framing members.

3.2.3. **Ceiling Insulation**

3.2.3.1. Ensure full coverage of suspended ceilings by lapping or snugly joining insulation.

3.2.4. **Semi-rigid Cavity Insulation**

3.2.4.1. Install using securement plates provided under Section 04080
3.2.4.2. Apply adhesive around openings and edges.
3.2.4.3. Fasten insulation to substrates at spacing recommended by manufacturer.

3.2.5. **Foamed-in-Place Insulation**

3.2.5.1. Install between window and door frames and all rough openings provided for structural attachments through thermal and air/vapour barrier to provide the integrity of a continuous thermal air/vapour barrier in compliance with OBC.

3.3. Adjustment

3.3.1. Repair and seal breaks, punctures, and other openings in the vapour barrier by application of pressure sensitive vapour barrier tape. Clean surface before taping, and apply smoothly and in full contact.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to this Section is Specified in:

Section 03300: Cast-in-place Concrete
Section 04200: Unit Masonry
Section 06101: Rough Carpentry:
Section 07190: Vapour Retarder and Air Barrier
Section 07212: Board Insulation:
Section 07270: Air Barriers
Section 07920: Sealants and Caulking
Section 08111: Steel Doors and Frames
Section 08920: Glazed Aluminum Curtain Walls

1.2. System Intent

1.2.1. Thermal Insulation Requirements

1.2.1.1. This section specifies requirements for sprayed polyurethane foam primarily intended for use as thermal insulation. Materials of this section shall provide continuity of thermal insulation, of the air barrier, and of the vapour barrier in conformance with the requirements of the OBC.

1.2.2. Air Barrier Requirements

1.2.2.1. This section specifies additional requirements for sprayed polyurethane foam insulation intended for use as the main component of an air barrier system.
1.2.2.2. Prevent exfiltration and infiltration under all conditions of air pressure differentials resulting from mechanical systems of the building, and barometric pressure and wind forces within limited specified and as imposed by jurisdictional authorities.

1.2.3. Vapour Barrier Requirements

1.2.3.1. This section specifies additional requirements for sprayed polyurethane foam insulation intended for use as the designated vapour barrier system.
1.2.3.2. Incorporate barriers in construction envelope to ensure that air leakage, and water vapour permeance in excess of 0.025 perms, is prevented through them. Seal each crack, joint and penetration by other components to maintain integrity of barrier.

1.2.4. Interface with Adjacent Systems

1.2.4.1. Coordination between all installers of components of the sprayed foam insulation system is essential to ensure continuity of the air barrier and that junctions between the various components are effectively sealed.

1.2.4.2. Verify with Architect, installation procedures of building products incorporated into sprayed foam insulation system including but not limited to, various barrier membranes, sheet metal closers and sealants, as well as continuity with roofing membrane where applicable.
1.2.4.3. Materials of this section shall provide continuity of thermal insulation, of the air barrier, and of the vapour barrier at the building enclosure in conjunction with the work of other sections specified.

1.3. Quality Assurance

1.3.1. Requirements of Regulatory Agencies

1.3.1.1. Install only sprayed foam insulation with an inherent fire hazard classification in all its parts that is with in limits established by jurisdictional authorities.
1.3.1.2. Validate fire hazard classification only by testing laboratories acceptable to jurisdictional authorities.
1.3.1.3. Attach Underwriters' Laboratories labels to packages of fire rated materials, where applicable.
1.3.1.4. Completely isolate cavity wall insulation from the interior of the building by non-combustible materials.

1.3.2. Mock-Up

1.3.2.1. Install insulation for mock-up specified in Section 04200.

1.3.3. Contractor Qualification

1.3.3.1. Application of sprayed foam insulation shall be by an application certified by CUFCA/NECA (Canadian Urethane Foam Contractors Association/National Energy Conservation Association) and who has adequate plant, equipment and skilled trades people to perform it expeditiously and is known to have been responsible for satisfactory installation similar to that specified during a period of the immediate past 5 years.
1.3.3.2. Provide proof of certification upon request.

1.3.4. Source Quality Control

1.3.4.1. Material manufacturer/distributor must have an on-site quality assurance/control program.
1.3.4.2. Maintain at least one (1) copy of installation manual and at least one (1) copy of quality assurance program on site.
1.3.4.3. Contractor shall perform daily on-site testing as directed by material manufacturer.

1.4. References

1.4.1. Reference Standards

1.4.1.1. ULC S705.1.01 “Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.
1.4.1.2. ULC S705.1.02 “Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Installation.

1.4.1.3. CAN/CGSB-51.80M, One Component Post Expanding Polyurethane Foam Scaling Compound.

1.5. Submittals

1.5.1. Documentation

1.5.1.1. Submit one (1) copy of a complete package which outlines the Material Manufacturers' quality assurance/control program.
1.5.1.2. Submit one (1) copy of the installation instructions.
1.5.1.3. Submit one (1) copy of the product data, including the material characteristics, performance criteria, limitations and Materials Safety data Sheet.

1.5.2. Affidavits

1.5.2.1. Submit affidavits that products and the completed installation meet the specified requirements.

1.6. Delivery, Storage and Handling

1.6.1. Package insulation materials and label them to designate manufacturer, type, density and insulation value, and reference standard specification number if applicable.

1.6.2. Store insulation materials in dry areas, protected from wetting and traffic.

1.6.3. Store and install insulation materials subject to damage by water, freezing, sunlight or similar adverse environmental conditions with adequate protection against damage.

1.6.4. Ensure that materials are stored a at minimum temperature of 4°C for 12 hours before installation, and that freezable adhesives are stored only at temperatures above 0°C at all times

1.7. Site Conditions

1.7.1. Environmental Requirements

1.7.1.1. Ambient/Substrate Temperature

1.7.1.1.1. Do not apply insulation or system components when surface or ambient air temperatures are below 5°C.
1.7.1.1.2. Consult Material Manufacturer when there is a difference of 17°C or more between the ambient air temperature and the substrate temperature for recommendations for suitable practices.

1.7.1.2. Moisture/Humidity

1.7.1.2.1. Consult Material Manufacturer when the relative humidity rises above 80%.

1.7.1.3. **Wind**

1.7.1.3.1. Insulation shall not be installed on the exterior when wind speeds exceed 24km/h unless wind screens are used adjacent to the immediate work area.

1.8. Warranty

1.8.1. Extended Warranty

1.8.1.1. Warrant the work of this Section for a period of not less than 10 years.
1.8.1.2. Contractor warrants that the sprayed foam insulation system is suitable for use in this type of installation.
1.8.1.3. Promptly correct, at own expense, defects or deficiencies which become apparent within the warranty period. Without restricting generality of warranty, defects shall include failure to stay in place, loss of thermal value, deterioration of insulation, undue expansion, splitting of materials, staining or other damage to surrounding or adjacent surfaces or materials.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. General

2.1.1.1. Ensure that all materials of an insulation system, and the construction with which it is in contact, are compatible, including but not limited to thru-wall flashings, air barrier systems, roofing membranes.

2.1.2. Sprayed Foam Insulation

2.1.2.1. Foam Insulation: sprayed/frothed polyurethane foam to CAN/CGSB-51.23-92, RSI 1.05 (R6/1") at density of 32.8 kg/cu.m. (2lb/cu.ft): Insul - Barrier or approved alternative.
2.1.2.2. Insulation Foam Air Barrier Sealant: Closed cell single component liquid system with density of 27.2 kg./cu.m. (1.7 lb.cu.ft.) RSI 1.0 (R5.7/1") and compressive strength of 10% compression at 96.5 kpa (14 psi);
2.1.2.3. Acceptable products: BASF Waltite, Demilec/ Cornell Heatlock 0240/ Airmetic 0223/ PFSI Polar Foam 7300.

2.1.3. Firestopping

2.1.3.1. **Horizontal firestopping**: Preformed angle from minimum 1.2mm (18ga) steel core with zinc coating conforming to ASTM A525 (G90-galvanized).Angle fabrication shall be such that horizontal section of angle perpendicular to substrate shall protrude past the finished face of spray insulation by 13mm to allow for subsequent installation of mineral fibre firestop to this angle by Section 04200.

2.1.3.2. **Vertical firestopping**: Preformed angle from minimum 0.38 (28ga) steel core with zinc coating conforming to ASTM A525 (G90 galvanized). Angle fabrication shall be such that vertical section of angle perpendicular to substrate shall protrude past the finished face of spray insulation for the full depth of the cavity to contact the backside of the veneer to close off the cavity.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Before commencing installation of insulation, ensure that all surfaces to which insulation is to be applied, are clean, reasonably smooth with no abrupt changes in plane, free of grease and with protruding fins of mortar or concrete removed, and that the surfaces are otherwise acceptable for insulation application as specified.

3.1.2. Verify that surfaces and conditions are ready to accept the Work of this section. Application of Work of this Section shall be deemed acceptance of existing work and existing conditions. Report in writing defects in substrates which may adversely affect the performance of the foam insulation.

3.1.3. Examine joints before sealing to ensure configuration, surfaces and widths are suitable for foam sealant. Report in writing the location of joints which are deemed unacceptable for the application of joint sealant.

3.2. General

3.2.1. **Vapour Retarder**

3.2.1.1. Ensure specified integrity of vapour barrier perm rating and air barriers are maintained. The extreme care that the barriers are sealed where elements penetrate them, and that they extend across and are sealed at junctions between other parts of the barrier system.

3.2.2. **Install Air Seal Barriers to Ensure**

3.2.2.1. That they are supported, secured in a manner to withstand differential air pressure forces without displacement, loss of air seal properties.
3.2.2.2. That continuity of the air seal barrier system is maintained in the exterior walls enclosing the building.
3.2.2.3. That the air seal is maintained intact at junctions of partitions, stack locations and other components with wall and roof construction, penetrations of the barrier by other construction components, and by careless foam insulation.

3.2.3. Provide airtight seal at penetrations of sprayed foam insulation systems, and at junctions of such systems with other construction.

3.2.4. Where shown on Drawings, install foam insulation to ensure continuity of vapour retarder, air barrier and insulation systems. Install in sufficient depths in order to match R value of surrounding wall/window/door/roof system.

3.3. Installation

3.3.1. **Preparation**

3.3.1.1. Surfaces to receive foam insulation shall be free of frost, loose or foreign matter which might impair adhesion of materials.

3.3.1.2. Prepare surface by brushing, scrubbing, scraping or grinding to remove loose mortar, dust, oil, grease, oxidation, mill scale and other contaminants which will affect adhesion and integrity of the foam insulation system. Wipe down metal surfaces to remove release agents or other non-compatible coatings, using clean sponges or rags soaked in a solvent compatible with the foam insulation. Ensure surfaces are dry before proceeding.

3.3.1.3. Prepare joints to receive foam air barrier sealant by brushing, scrubbing, wiping, scraping or grinding to remove loose mortar, dust, oil, grease, solvents, oxidation, mill scale and other contaminants which will affect adhesion and integrity of foam sealant.

3.3.2. **Application**

3.3.2.1. Apply foam insulation in strict accordance with manufacturer's written instructions, specifications or recommendations.

3.3.2.2. Apply foam insulation only when surfaces and ambient temperatures are within limits prescribed by the material manufacturer.

3.3.2.3. Fill joints with foam sealant making allowances for post expansion of foam.

3.3.2.4. Finish joints shall be free from air pockets and imbedded foreign materials. Cut back excess foam sealant after cutting flush with surrounding surfaces unless otherwise directed and/or detailed.

3.3.2.5. Apply foam insulation to within the following tolerances: +6.4mm (1/4") mm of thicknesses indicated on drawings.

3.3.2.6. Finished sprayed foam insulation shall be free of voids and embedded foreign materials.

3.3.2.7. Do not allow foam insulation to cover or mark adjacent surfaces. Use masking materials if necessary.

3.3.2.8. Remove over-spray and masking materials immediately after foam has cured to hard surface film.

3.3.2.9. Clean and make good surfaces soiled or damaged by Work of this section. Consult with Section of Work soiled before cleaning to ensure methods used will not damage their Work.

3.3.2.10. Do not permit adjacent Work to damage Work of this Section. Damage to Work of this Section caused by other sections shall be made good by this Section at the expense of the Section which caused the damage.

3.3.3. **Field Quality Control**

3.3.3.1. The insulation system will be inspected after installation to verify its total integrity.

3.3.3.2. Inform the Architect when portions of the system have been installed and before they are covered by other construction or their accessibility for inspection is otherwise impeded.

3.3.3.3. Arrange to have a technical representative who is familiar with specified products and their installation on site during application of the materials and to inspect system when completed.

3.3.3.4. Density and adhesion/cohesion tests shall be performed and recorded for each job site/each day/for each batch used/for each substrate.

3.3.4. **Adjustment**

3.3.4.1. Examines completed system. Repair and seal all breaks in system to ensure maintenance of its integrity.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section is Specified in:

Section 02200: Earthwork, for excavation and backfilling.
Section 03300: Cast-in-Place Concrete

1.2. References

1.2.1. Reference Standards

1.2.1.1. Reference standard quoted in Contract Documents refers to:
1.2.1.2. CGSB Specification 51-GP-20M, Thermal Insulation, Expanded Polystyrene.

1.3. Delivery, Storage, and Handling

1.3.1. Store insulation materials in dry areas, protected from wetting, sunlight and traffic. Store insulation board flat, on a flat surface, and to prevent edge damage and placing of materials on top of stored boards.

1.3.2. Ensure that insulation board and adhesives are stored at a minimum temperature of 4°C for 12 hours before installation, and that freezable adhesives are stored only at temperatures above 0°C at all times.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Insulation Board

2.1.1.1. Closed-cell, cellular, foamed, smooth skin, extruded polystyrene to meet specified requirements of CGSB Specification 51-GP-20M, Type 4: Styrofoam SM by Dow Chemical Canada Inc., or approved alternative, in thickness indicated on Drawings.
2.1.1.2. Cement faced insulation board.
2.1.1.2.1. Dow Styrofoam CT board for perimeter foundation walls.
2.1.1.3. To meet specified requirements of CSA Standard A101, Type IA, friction fit.

2.1.2. Adhesive

2.1.2.1. Only as approved by Board supplier; and that can be handled at temperature of 4°C and over, have adequate early and permanent bond and tensile strength for application, and have a service temperature between high and low temperatures to which they will be subjected.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Before commencing installation of insulation, ensure that all surfaces to which insulation board is applied are clean, reasonably smooth with no abrupt changes in plane, free of grease and with protruding fins of mortar or concrete removed, and that the surfaces are otherwise acceptable for insulation application as specified.

3.2. Installation

3.2.1. General

3.2.1.1. Do not install insulation in areas of the building unprotected from water, freezing or similar damaging environmental conditions.
3.2.1.2. Fit insulation snug without compression into every void to ensure full thickness for full length of construction, to prevent air movement simultaneously both sides of insulation.
3.2.1.3. Install insulation tightly against interior finish construction, except that when pipes and ducts occurs within wall construction install it between exterior finish construction and the pipes or ducts.
3.2.1.4. Cut and fit insulation tightly around pipes, conduits, outlet boxes and other similar components.
3.2.1.5. Install insulation in one piece for full length of voids. Where this is impossible, join lengths with ends fitted snugly or overlapped.
3.2.1.6. Apply insulation to ensure total and complete coverage of all surfaces to be insulated, and in direct contact with such surfaces.

3.2.2. Foundation Wall Insulation

3.2.2.1. Provide cement faced insulation at all exterior face of perimeter foundation walls. Fasten with clips and adhesive.
3.2.2.2. Secure insulation by adhesive if backfilling is not immediately placed to retain panels in place.
3.2.2.3. Prime surfaces before application of adhesive only where and as recommended by adhesive manufacturer.
3.2.2.4. Apply 50 mm diameter pads of adhesive to faces of panels as required to hold board in place on walls.
3.2.2.5. Position and press boards into full contact with adhesive, and temporarily hold them in place until adhesive has set.
3.2.2.6. Ensure that backfilling is completed within 24 hours, and that it does not dislodge or damage insulation.

3.2.3. Installation of Slab Insulation

3.2.3.1. Lay insulation board over compacted fill for slab base.
3.2.3.2. Secure in place to prevent dislodgement when slab is poured.
3.2.3.3. Ensure that slab is poured within 24 hours.

3.3. Protection

3.3.1. Do not expose insulation board to sunlight after installation. Protect it with opaque polyethylene or tarpaulin cover as recommended by manufacturer if backfilling is not completed within 24 hours; and, as soon as practicable, backfill and pour concrete slab.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to this Section is Specified in

Section 04200: Forming Reglets.
Section 04200: Sheet Metal Built In Masonry
Section 07411: Preformed Metal Siding.
Section 07520: 2 - Ply Modified Bitumen Membrane Roofing
Section 07920: Sealants and Caulking, Other Than Sheet Metal Joints
Section 09900: Painting and Finishing
Division 15 : Flashings Specified for Mechanical Installations
Division 16 : Flashings Specified for Electrical Installations

1.1.3. Supply of Work Which Shall be Installed by This Section

1.1.3.1. To furnish pre-coated sheet metal

1.1.4. Installation of Work Which Shall be Supplied by This Section is Specified in

Section 03300: To install flashing reglets.

1.1.5. This Section Shall Include Performance of Work Which is Specified in

Section 07520: To specify field quality control and submission of inspection reports.
Section 07900: To specify caulking at sheet metal joints.

1.1.6. Work Included in This Section

1.1.6.1. Generally the work of this section will include, but will not be limited to the following:
: all galvanized metal flashings for counter flashings at all parapets, curbs, roof openings not normally exposed to view,
: all flashings not specifically covered or detailed by other related sections.

1.2. Quality Assurance

1.2.1. Subcontractor Qualifications

1.2.1.1. Provide sheet metal specified in this Section only by a Subcontractor who has adequate plant, equipment and skilled tradesmen, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past five years.

1.3. References

1.3.1. Reference Standards

1.3.1.1. Reference standards quoted in Contract Documents refer to:
1.3.1.2. ASTM A525-81, Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, General Requirements.
1.3.1.3. CGSB Specification 1-GP-108M, Paint, Acid and Alkali Resistant, Black.

1.4. Submittals

1.4.1. Samples

1.4.1.1. Submit samples of pre-coated finish and sheet metal joints if requested.

1.5. Delivery, Storage, and Handling

1.5.1. Protect sheet metal during handling and storage to prevent rusting, staining, abrasion of finish coatings, bending and denting.

1.5.2. Protect surfaces of pre-coated metal to prevent scratching.

1.6. Warranty

1.6.1. Extended Warranty

1.6.1.1. Warranty contained in GC24 is, with respect to Section 07600, extended from 1 year to 5 years. Without restricting generality of warranty, defects shall include leaking, failure to stay in place under expansion, lifting, deformation, deterioration, etc.
1.6.1.2. Contractor hereby warrants that system is suitable for use in this type of installation.
1.6.1.3. Contractor shall arrange with Consultant and/or Owner, about 1 month before warranty expires, to visit site, examine installation specified in this section and make necessary repairs. Should Contractor fail to make such arrangement through no fault or neglect of Owner or Consultant, then period of warranty shall extend to one month after such arrangement is made.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Galvanized Steel Sheet

2.1.1.1. ASTM Specification A525, zinc coating designation Z275; flashings, 0.5 mm thick; cleats and edge strips, 1.6 mm thick; other work in thickness indicated on drawings or specified.

2.1.2. Pre-coated Finish

2.1.2.1. Use sheet metal with pre-coated finish where metal is exposed to view.
2.1.2.2. Baked enamel or other coatings as may be specified in other sections, applied to galvanized sheet steel in shop by continuous coating line, by Stelco or Dofasco.
2.1.2.3. Colour to match new corrugated siding.

2.1.3. **Solder**

2.1.3.1. New, one half pig lead, one half block tin.

2.1.4. **Flux**

2.1.4.1. For galvanized steel, resin type.

2.1.5. **Fasteners**

2.1.5.1. Use only nails, bolts, screws and other fasteners of the same metal and with the same finish as the metal being fastened. Use fasteners of a size suitable for the particular fastening condition and service. Use only approved nails, bolts, screws and other fasteners

2.1.6. **Metal Flashing Reglets**

2.1.6.1. 0.6 mm thick galvanized steel, open type at least 50 mm sloped depth, with receiving slot sloping up 45°, wedges, soft lead.

2.1.7. **Caulking**

2.1.7.1. One or two part polysulphide specified in Section 07920.

2.1.8. **Felt**

2.1.8.1. No. 15 asphalt saturated roof felt, to meet specified requirements of CSA Standard A123.3.

2.1.9. **Building Paper**

2.1.9.1. Smooth, unsaturated quality, rosin-sized paper weighing not less than 0.25 kg/sq.m.

2.1.10. **Bituminous Paint**

2.1.10.1. To meet specified requirements of CGSB Specification 1-GP-108.

2.2. Fabrication

2.2.1. Fabricate all possible sheet metal in shop by brake forming, and bench cutting, drilling and shaping.

2.2.2. Form bends with straight sharp lines, angles and arises; and sheets into true planes free from twists, buckles, dents and other visual distortions.

2.2.3. Supply accessories required for installation of sheet metal specified in this Section. Fabricate accessories of same material as sheet metal with which they will be incorporated.

PART 3 - EXECUTION

3.1. Installation

3.1.1. General

3.1.1.1. Install sheet metal exposed to view in straight lines, with junctions aligned and on same plane.

3.1.1.2. Install sheet metal wherever possible on runs of equal 2400 mm lengths except where conditions for securing dictates that shorter and equal 1200 mm lengths are preferable.

3.1.1.3. Install pre-coated sheet metal wherever possible in minimum lengths of 3600 mm on typical runs, except where conditions for securing dictates that shorter and equal 1200 mm lengths are preferable.

3.1.1.4. Supply flashing reglets required by this Section, to other Sections responsible for their installation. Assist others in their location.

3.1.1.5. Install sheet metal to prevent entry of water under service and weather conditions.

3.1.1.6. Back paint, with two coats of bituminous paint at rate of 1 L/sq.m., sheet metal that is not given pre-coated finish and that comes into contact with another kind of metal, or masonry or concrete.

3.1.1.7. Install sheet metal with concealed fastenings. Exposed fastenings will be permitted only as approved when concealed fastenings are impossible. Fasten sheet metal, clips and other components in an approved manner, with fasteners weather tight and evenly and neatly located. Do not use pop rivets.

3.1.1.8. Join sheet metal by slip lock seams to permit thermal movement. Space joints evenly where exposed. Lock seam and solder internal corners. Form mitres with standing seams in pre-coated metal.

3.1.1.9. At exposed sheet metal, install expansion joints with 200 mm wide hooked covers, bedded in caulking compound, fastened at one side only, and at intervals of approximately 6.0 m., or as otherwise shown on Drawings or approved.

3.1.1.10. Install 50 mm X 75 mm cleats where required to fasten sheet metal. Secure each cleat to backing with 2 nails, space cleats at 300 mm o.c. generally.

3.1.1.11. Install edge strips in lengths of approximately 2400 mm, continuously, and with 6 mm between each length. Fasten at 300 mm o.c.

3.1.1.12. Do not form open joints or pockets that fail to drain water.

3.1.1.13. Caulk all reglets and open sheet metal joints that do not mechanically provide weather tight construction, in accordance with Section 07920.

3.1.1.14. Apply No. 15 roofing felt under sheet metal installed directly over masonry, concrete, or wood. Secure felt in place, and lap joints 100 mm as sheet metal is installed. Turn up edges 150 mm where used on horizontal surfaces. Lay rosin-sized building paper over felts.

3.1.1.15. Secure sheet metal by nailing at 150 mm o.c. where concealed, unless otherwise specified or indicated on Drawings.

3.1.2. Flashings

3.1.2.1. At masonry: Wedge flashings into joints and reglets with lead at 300 mm o.c. Caulk remainder of joint and reglet.

3.1.2.2. Install metal flashings as indicated on Drawings or as otherwise required where building components penetrate exterior construction, and for which flashing is not specified by other Sections. Fasten by cleats in doubled back edges of drips.

3.1.3. **Roof Edge Trim**

3.1.3.1. Install 0.5 mm thick galvanized steel trim secured by nailing and edge strip.

3.1.4. **Roof Control Joints**

3.1.4.1. Install 0.5 mm thick galvanized sheet cover secured by edge strips to joint movement.

3.1.5. **Copings**

3.1.5.1. Install 0.5 mm thick galvanized steel secured by edge strips.

3.1.6. **Fascias**

3.1.6.1. Install prefinished 0.5 mm thick galvanized steel as indicated on drawings with bottom secured by edge strips to match existing conditions.

3.1.7. **Suppers and Downspouts**

3.1.7.1. Fabricate of prefinished 0.5 mm thick galvanized steel to profiles and sizes to match existing conditions. Install these items using galvanized fasteners.

3.2. Cleaning

3.2.1. Remove flux residue completely from surfaces and crevices, remove other deposits, stains or protection and wash metals left unpainted and exposed to view as recommended by the manufacturer of the metal.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Related to This Section Performed by Other Sections

Section 03300: concrete surface preparation
Section 04200: unit masonry
Section 09250: gypsum board partitions

1.1.3. Work Related to This Section Specified Elsewhere

1.1.3.1. Fire stopping and smoke seals within mechanical assemblies and electrical assemblies are specified in Divisions 15 and 16 respectively.

1.2. Quality Assurance

1.2.1. Requirements of Regulatory Agencies

1.2.1.1. Install only firestopping with an inherent fire hazard classification in all its parts that is within limits established by jurisdictional authorities.
1.2.1.2. Validate fire hazard classification only by testing laboratories acceptable to jurisdictional authorities.
1.2.1.3. Attach Underwriters' Laboratories labels to packages of fire rated materials.

1.3. References

1.3.1. Reference Standards

1.3.1.1. Reference standards quoted in Contract Documents refer to:

1.3.1.1.1. CAN4-S115-M85, Standard Method of Fire Tests of Firestop Systems
1.3.1.1.2. CAN4-S101-M85, Standard Methods of Fire Endurance Tests of Building Construction.

1.4. Submittals

1.4.1. Samples

1.4.1.1. Submit duplicate 300mm x 300mm samples showing actual firestop materials in accordance with Section 01300.

1.5. Shop Drawings

1.5.1. Submit shop drawings to show proposed materials reinforcement, anchorage, fastenings and method of installation. Shop drawing details must accurately reflect actual job conditions.

1.5.2. Submit manufacturer's product data for materials and prefabricated devices, providing descriptions sufficient for identification on job site. Submit manufacturer's printed instructions for installation.

1.6. Delivery, Storage and Handling

1.6.1. Package firestopping materials and label to designate manufacturer and type.

1.6.2. Store firestopping materials in dry areas, protected from wetting and traffic.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Firestopping and smoke seal systems shall be in accordance with CAN4-S115-M85; asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN4-S115-M85 and not to exceed opening sizes for which they are intended.

2.1.2. Service penetration assemblies; certified by ULC in accordance with CAN4-S115-M85, and listed in ULC Guide No. 40 U19.

2.1.3. Service penetration firestop components; certified by ULC in accordance with CAN4-S115-M85, and listed in ULC Guide No. 40 U19.3 and ULC Guide No. 40 U19.5 under the Label Service of ULC.

2.1.4. Firestop systems ratings shall be in accordance with Drawings and as specified herein.

2.1.5. Fire resistance rating of installed firestopping assembly not be less than the fire resistance rating of the surrounding floor and wall assembly.

2.1.6. Firestopping and smoke seals at openings intended for ease of re-entry such as cables : elastomeric seal; do not use cementitious or rigid seal at such locations.

2.1.7. Firestopping and smoke seals at openings around penetrations for pipes, ductwork, and other mechanical items requiring sound and vibration control: elastomeric seal; do not use a cementitious or rigid seal at such locations.

2.1.8. Primers - to manufacturer’s recommendations for specific material, substrate and end use.

2.1.9. Water - potable, clean and free of injurious amounts of deleterious substances.

2.1.10. Damming and back-up materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

2.1.11. Sealants for vertical joints: non sagging.

2.2. Joint Firestops

2.2.1. **Vertical Joints**

2.2.1.1. Type "MW" insulation, packaging marked with ULC label, minimum 95 mm depth, as supplied by Instant Firestop Inc., North York, Ontario.

2.2.2. **Horizontal Joints**

2.2.2.1. "A/D Firebarrier Mineral Wool" insulation, packaging marked with ULC label, minimum 88 mm depth, as supplied by A/D Fire Protection Systems Inc.

2.3. Service Penetrations

2.3.1. For both horizontal and vertical separations.

2.3.2. Permanent Forming Material: mineral wool insulation minimum density of 70.5 kg/m³.

2.3.3. Temporary Forming Material: nominal 25 mm thick, polystyrene boards.

2.3.4. Fire Stop System Component: Type "Fire Stop Sealant, Cat. 2000 or CS 2400" by Dow Corning Canada Inc. or A/D Firebarrier Silicone by A/D Fire Protection Systems Inc. Tremstop Fyre-Sil Silicone by Tremco Canada.

PART 3 - EXECUTION

3.1. Preparation

3.1.1. Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

3.1.2. Prepare surfaces in contact with firestopping materials and smoke seals to manufacturer’s instructions.

3.1.3. Maintain insulation around pipes and ducts penetrating fire separation.

3.1.4. Mask where necessary to avoid spillage and over coating onto adjoining surfaces.

3.2. Installation

3.2.1. Install firestopping and smoke seal materials and components in accordance with ULC certification and manufacturer’s instructions.

3.2.2. Install firestopping assemblies of same fire resistance rating as for the fire resistance rating of the floor or wall or partition.

3.2.3. Seal holes or voids made by through penetrations, poke through termination devices and unpenetrated openings or joints to ensure continuity and integrity of fire separation and maintained.

3.2.4. Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

3.2.5. Tool or trowel exposed surfaces to a neat finish.

3.2.6. Remove excess compound promptly as work progresses and upon completion.

3.2.7. **Joint Firestops**

3.2.7.1. **Vertical Joints**

3.2.7.1.1. Install specified insulation in one piece in accordance with manufacturers printed recommendations, width of insulation to be not greater than 75% of uncompressed width of insulation, to meet requirements of ULC System No. JF3.

3.2.7.2. **Horizontal Joints**

3.2.7.2.1. Install specified insulation to minimum 88 mm depth, uncompressed width of insulation to be 1/3 wider than opening, butt end joints; to meet requirements of ULC System No. JF9.

3.2.8. **Service Penetrations**

3.2.8.1. For both horizontal and vertical separations.
3.2.8.2. To meet requirements of ULC System No. SP83.
3.2.8.3. For floor assembly:
3.2.8.3.1. Install 70 mm mineral wool centred in opening.
3.2.8.3.2. Install 12.7 mm thick firestop component to top side (floor).
3.2.8.4. For wall assembly:
3.2.8.4.1. Install 57 mm mineral wall centred in opening.
3.2.8.4.2. Install 12.7 mm thick firestop component to both sides of opening.

3.3. Inspection

3.3.1. Notify both Architect and authorities having jurisdiction when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

3.4. Schedule

3.4.1. Install firestop and smoke seal at:

3.4.1.1. Penetrations through fire resistance rated masonry, concrete and gypsum board partitions and walls.
3.4.1.2. Edge of floor slabs at curtain wall and precast concrete panels.
3.4.1.3. Top of fire resistance rated masonry and gypsum board partitions.
3.4.1.4. Intersections of fire-resistance rated masonry and gypsum board partitions.
3.4.1.5. Control and swag joints in fire resistance rated masonry and gypsum board partitions and walls.
3.4.1.6. Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
3.4.1.7. Openings and sleeves installed for future use through fire separations.
3.4.1.8. Around mechanical and electrical assemblies penetrating fire separations.
3.4.1.9. Rigid ducts: firestopping to consist of bead of firestopping materials between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

3.5. Clean-up

3.5.1. Remove excess materials and debris and clean adjacent surfaces immediately after application.

3.5.2. Remove temporary dams and forming after initial set of firestopping and smoke seal materials.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section is Specified in

Section 04200: Raking of Masonry Joints

1.1.3. Work Included Elsewhere but Performed in Compliance with This Section

Section 04200 - Unit Masonry
Section 08110 - Steel Doors and Frames
Section 06200 – Rough Carpentry
Section 06200 – Finish Carpentry
Section 09250 - Gypsum Board
Section 10800 - Washroom Accessories

1.2. Quality Assurance

1.2.1. Subcontractor Qualifications

1.2.1.1. Seal joints specified in this Section by Subcontractor approved by manufacturers of sealants; who has equipment adequate for Project, skilled tradesmen to perform it expeditiously; and known to be responsible for satisfactory installations similar to that specified during at least the immediate past five years.

1.3. References

1.3.1. Reference Standards

1.3.1.1. Reference Standards quoted in Contract Documents refer to:
1.3.1.2. CGSB Specification 19-GP-5M, Sealing Compound, One Component, Acrylic Base, Solvent Curing.
1.3.1.3. CGSB Specification 19-GP-9Ma, Sealing Compound,
1.3.1.4. One Component, Silicone Base, Chemical Curing
1.3.1.5. CAN/CGSB-19.13-M82, Sealing Compound, One Component, Elastomeric, Chemical Curing.
1.3.1.6. CAN/CGSB-19.24-M80, Sealing Compound, Multi-Component, Chemical Curing.

1.4. Submittals

1.4.1. Samples

1.4.1.1. Submit samples of sealant and backing if requested.

1.4.2. Product List

1.4.2.1. Submit manufacturer's and product's name for each sealant which will be used for Project, before commencing joint sealing.

1.5. Site Conditions

1.5.1. **Environmental Conditions**

1.5.1.1. Apply sealants only to completely dry surfaces, and at air and material temperatures above minimum established by manufacturer's specifications.

1.6. Warranty

1.6.1. **Extended Warranty**

1.6.1.1. Submit a warranty of the joint sealant installation specified in this Section covering the period for four years beyond the expiration of the warranty period specified in the General Conditions to the Contract, including materials and application. Replacement of joint sealants shall include removal of defective materials, preparation for and application of new material, and the repair and making good of damaged adjacent materials.

1.6.1.2. Defective joint sealant installation shall include, but not be restricted to, joint leakage, hardening, cracking, crumbling, melting, bubbling, shrinkage, running, sagging, change of colour, loss of adhesion, loss of cohesion, and staining of adjoining or adjacent materials or surfaces.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. All materials utilized in a sealant system shall be compatible.

2.1.2. Specified proprietary products are minimum acceptable quality. Products of other manufacturers of equal or superior quality will be accepted where specifically approved by Architect.

2.1.3. **Sealants**

2.1.3.1. Provide sealant formulation recommended by manufacturer for type of joint, substrate and service conditions applicable.

2.1.3.2. Refer to Caulking Schedule for utilization of the following sealants.

2.1.3.3. Colours of sealants will be selected from manufacturer's standard range.

2.1.3.4. Acrylic Solvent Release, One Part, Sealant:

2.1.3.4.1. To meet specified requirements of CGSB Specification 19-GP-5.

2.1.3.4.2. PTI 738 by P.T.I. Sealants Ltd.

2.1.3.5. Two Part Urethane Sealant:

2.1.3.5.1. To meet specified requirements of CAN/CGSB-19.24-M80, and as recommended by manufacturer for conditions.

2.1.3.5.2. Dymeric 240 by Tremco Canada.

2.1.3.6. One Part Urethane Sealant:

2.1.3.6.1. To meet specified requirements of CAN/CGSB-19.13-M82, and as recommended by manufacturer for conditions.

2.1.3.6.2. Vulkem 45 SSL by Tremco Canada

2.1.3.6.3. Tremco Canada Dymonic FC

2.1.3.7. Silicone Sealant: One Part Sealant:
2.1.3.7.1. To meet specified requirements of CAN/CGSB-19.13-M82. Tremsil 200 by Tremco (Canada) Ltd., or as otherwise approved.
2.1.3.8. Two Part Polyepoxide Urethane Sealant:
2.1.3.8.1. To meet specified requirements of CAN/CGSB-19.24-M80. Dymeric by Tremco (Canada) Ltd.
2.1.3.9. One Part Polysulphide Sealant:
2.1.3.9.1. To meet specified requirements of CAN/CGSB-19.13-M82.
2.1.3.10. Two Part Polysulphide Sealant:
2.1.3.10.1. For use in joints except where subjected to traffic:
2.1.3.10.2. To meet specified requirements of CAN/CGSB-19.24-M80, non-sag, with a Shore "A" hardness range of 20 to 35.
2.1.3.11. Two Part Polysulphide Sealant:
2.1.3.11.1. For use at surfaces subjected to traffic:
2.1.3.11.2. To meet specified requirements of CAN/CGSB-19.24-M80, self-levelling, with a Shore "A" hardness range of 35 to 40.

2.1.4. **Primer**

2.1.4.1. Specifically designed for use with sealant compounds on surfaces encountered, and as specified by the compound manufacturer to assure adhesion of compound to prevent staining of substrate materials.

2.1.5. **Sealant Backing (Bedding Material)**

2.1.5.1. Extruded, foamed, closed cell, round, polyethylene, urethane, neoprene or vinyl rod, 30% greater diameter than joint width, with Shore "A" hardness of 20, and 830 - 900 kPa tensile strength, and manufactured especially for the purpose.

2.1.6. **Void Filler**

2.1.6.1. Mineral fibre as specified in Section 07200.

2.1.7. **Bond Breaker**

2.1.7.1. For installation where minimum specified depth of joints is unobtainable. Pressure sensitive plastic tape, 3M 3266 or #481.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Before commencing joint sealing, verify at site that joint configuration and surfaces have been provided as specified in other Sections to meet intent of sealant specification; that joint conditions will not adversely affect execution, performance or quality of completed sealed joints; and that they can be put into acceptable condition by means of preparation specified in this Section. If in doubt, verify site conditions together with manufacturer's representative of sealant to be applied.

3.1.2. Ascertain that sealers and coatings applied to sealant substrate are compatible with the sealant used and that full bond between sealant and substrate is attained. Request samples of the sealed or coated substrate from their fabricators for testing of comparability and bond if necessary.

3.1.3. Verify specified environmental conditions are ensured before commencing joint sealing.

3.1.4. Defective sealed joints resulting from application to unsatisfactory joint conditions will be considered the responsibility of this Section.

3.1.5. **Preparation**

3.1.5.1. Remove loose mortar, dust, oil, grease, oxidation, mill scale, coatings, all other materials affecting bond of compounds to surfaces that sealant compounds must adhere, except for painted surfaces, by brushing, scrubbing, scraping or grinding.

3.1.5.2. Clean down caulked metal surfaces with clean cellulose sponges or rags soaked in solvent recommended by sealant manufacturer, and wipe dry with clean cloths. Ensure that solvent is not injurious to painted surfaces.

3.1.5.3. Use method of preparation suitable for substrate as recommended by sealant manufacturer, and that does not damage adjacent surfaces.

3.1.5.4. Ensure that releasing agents, coatings or other treatments have either not been applied to joint surfaces, or that they are entirely removed.

3.1.6. **Application**

3.1.6.1. Except where specified in other Sections, seal open joints in surfaces exposed to view, and to make the building weathertight and airtight as applicable; as indicated typically on Drawings, and as otherwise specified. Refer to Article 3.05, Caulking Schedule. Include, but do not restrict it to, sealing the following joints:

3.1.6.1.1. Perimeter joints of exterior and interior pressed steel opening frames where installed in masonry and a weathertight joint is otherwise required.

3.1.6.1.2. Perimeter joints of exterior and interior aluminum opening frames.

3.1.6.1.3. Perimeter joints of exterior louvre and vent frames.

3.1.6.1.4. Joints between underside of window sills and walls.

3.1.6.1.5. Exposed control joints in masonry walls.

3.1.6.1.6. Exposed expansion joints in masonry walls.

3.1.6.1.7. Exposed control joints in concrete except for floors.

3.1.6.1.8. Exposed expansion joints in concrete.

3.1.6.1.9. Raked joints at masonry wall junctions and masonry to concrete junctions.

3.1.6.1.10. Interior and exterior exposed joints, between dissimilar materials, and not concealed from view.

3.1.6.1.11. Exposed control joints in gypsum/fiber reinforced gypsum panels.

3.1.6.1.12. Joints at wall floor junctions, and at floors unless indicated on Drawings.

3.1.6.1.13. Full length of exterior door saddles.

3.1.6.1.14. Close-fitted space between mechanical and electrical ducts, conduits and pipes, and walls and also at floors where fire separations must be maintained.
3.1.6.1.15. Joints between base angle and structure at preformed metal siding.
3.1.6.1.16. Prime surfaces to receive sealants as required by substrate and manufacturer's specifications to ensure positive and permanent adhesion, and to prevent staining.
3.1.6.1.17. Pack joints tightly with sealant backing set at depth specified for sealant. Fill other voids with filler.
3.1.6.1.18. Install bond breaker tape in bottom of joints in lieu of sealant backing where proper depth cannot be obtained when backing is installed.
3.1.6.1.19. Maintain depth of sealant as follows for joint widths of
3.1.6.1.19.1. : 6 mm (minimum joint width): joint depth 6 mm.
3.1.6.1.19.2. : 6 to 13 mm: depth equal to joint width.
3.1.6.1.19.3. : 13 to 25 mm: depth equal to 1/2 joint width.
3.1.6.1.19.4. : 25 to 50mm: maximum depth of 13 mm.
3.1.6.1.20. Install sealant in joints over 50 mm wide only after consultation with and approval of sealant manufacturer.
3.1.6.1.21. Fill joints with sealant compound to specified or indicated depths as indicated. Perform joint sealing in accordance with compound manufacturer's specifications, under his supervision, and using pressure guns and other equipment as approved by him. Finish joints with a full bead so that they are smooth; and free from ridges, wrinkles, air pockets and embedded foreign materials.
3.1.6.1.22. Tool surface of joints to a slight concave profile.
3.1.6.1.23. Make compounds workable only as manufacturer specifies.
3.1.6.1.24. Caulk joints in site painted materials after adjacent surfaces have been painted. Match compound to paint colour.
3.1.6.1.25. Do not allow sealants to cover or spot surfaces outside of joints. Use masking tape protection to prevent coating of adjacent surfaces if necessary.

3.1.7. **Cleaning**

3.1.7.1. Remove sealant smears and drippings, and masking tape immediately on completion of joint sealing.
3.1.7.2. Do not use chemicals, scrapers, or other tools which would damage surfaces from which excess compounds or drippings are removed. Make good materials damaged by cleaning by the installer of the damaged material and at the expense of this Section.
3.1.7.3. Instruct Contractor on proper final cleaning methods.

3.1.8. **Caulking Schedule**

3.1.8.1.1. **Type 1 Sealant**

3.1.8.1.1.1. One or Two Part Polysulphide Sealant, or
3.1.8.1.1.2. One or Two Part Urethane Sealant, or
3.1.8.1.1.3. One Part Silicone Sealant, or
3.1.8.1.1.4. Use at all locations except where another is specified.

3.1.8.1.2. **Type 2 Sealant**

3.1.8.1.2.1. Use at exterior joints between window frames and masonry.

3.1.8.1.3. **Type 3 Sealant**

3.1.8.1.3.1. One part Clear Silicone Sealant, mildew resistant.
3.1.8.1.3.2. Use at joints between:
3.1.8.1.3.2.1. Washroom fixtures and wall,
3.1.8.1.3.2.2. Washroom fixtures, water closets and floor,
3.1.8.1.3.2.3. Countertops and wall,
3.1.8.1.3.2.4. Cabinets and walls and adjacent finishes.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section is Specified in

Section 06200: Hanging of Wood Doors
Section 07920: Caulking Frames
Section 08710: Supply of Finish Hardware
Section 09900: Painting and Finishing

1.1.3. Installation of Products Supplied by This Section is Specified in

Section 04200: To build anchors/frames in masonry.
Section 06200: To set up frames in masonry openings.
Section 06200: To install hollow metal doors.
Section 09250: To install and anchor frames in drywall partitions.

1.2. Quality Assurance

1.2.1. Subcontractor Qualifications

1.2.1.1. Provide fabrications specified in this Section only by a Subcontractor who has adequate plant, equipment and skilled tradesmen to perform it expeditiously, and is known to have been responsible for satisfactory installations similar to that specified.

1.2.2. Requirements of Regulatory Agencies

1.2.2.1. Construct fire rated doors and frames of ratings indicated in accordance with validating label requirements, otherwise required by jurisdictional authorities.
1.2.2.2. Ensure hardware and installation meet CAN4-S104 requirements, Standard Method for Fire Tests of Door Assemblies adopted by Insurance Advisory Organization, when applicable.
1.2.2.3. Doors and frames indicated as labelled, to meet conditions of NFPA No. 80, for installation, and shall have attached ULC labels.

1.3. References

1.3.1. Reference Standards

1.3.1.1. Reference standards quoted in Contract Documents refer to:
1.3.1.2. ASTM A366-72, Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
1.3.1.3. ASTM A525-81, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements.
1.3.1.4. ASTM A526-80, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
1.3.1.5. ASTM A780-80, Standard Practice for Repair of Damaged Hot-Dip Coatings.

1.3.1.6. CGSB Specification 1-GP-132M, Primer, Zinc Chromate, Low Moisture Sensitivity.
1.3.1.7. CGSB Specification 1-GP-140M, Primer, Red Lead, Iron Oxide, Oil Alkyd Type.
1.3.1.8. CGSB Specification 31-GP-105M, Coating, Conversion, Zinc Phosphate, for Paint Base.
1.3.1.9. CGSB Specification 1-GP-181M, Coating, Zinc Rich, Organic, Ready Mix.
1.3.1.10. CSA Standard G164-M1981, Hot-Dip Galvanizing of Irregularly shaped Articles.

1.4. Submittals

1.4.1. Shop Drawings

1.4.1.1. Submit shop drawings.

1.5. Delivery, Storage, and Handling

1.5.1. Brace frame units to prevent distortion in shipment. Protect finished surfaces by sturdy protective wrappings.

1.5.2. Ensure that doors are stored in a secure dry location to ensure they are not damaged until hung. Remove wrappings when finally stored in location secure from damage. Store doors vertically, resting on planks, with blocking between to allow air to circulate.

1.5.3. Repair damage to finishes immediately as it occurs with matching specified finish materials.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Steel Sheet

2.1.1.1. Cold-rolled, stretcher levelled to meet specified requirements of ASTM Specification A366 or SAE Specification 1010: galvanized sheet, commercial quality, to meet specified requirements of ASTM Specification A526.

2.1.2. Prime Paint

2.1.2.1. General: Ensure that primers are compatible with specified finish paint.
2.1.2.2. Primer: To meet requirements of CGSB Specification 1-GP-132, 1-GP-81, or 1-GP-140.

2.1.3. Galvanizing

2.1.3.1. Full galvanized sheet steel; coating to meet specified requirements of ASTM Specification A525, zinc coating designation Z275.
2.1.3.2. Wiped coated sheet steel; zinc wiped coating to meet specified requirements of ASTM Specification A525, zinc coating ZF75.
2.1.3.3. Galvanized accessories; zinc coating to meet specified requirements of CSA Standard G164, including Appendix A.

2.1.4. **Zinc Rich Paint**

2.1.4.1. To meet specified requirements of CGSB Specification 1-GP-181.

2.1.5. **Panel Insulation**

2.1.5.1. At exterior: Polyurethane: closed cell rigid board, density; 32 kg/cubic metre.

2.1.6. **Grilles**

2.1.6.1. E.H. Price, Series STG1, steel, prime painted, sizes as shown on Door Schedule.

2.1.7. **Door Bumpers**

2.1.7.1. Single stud rubber at interior openings.

2.1.8. **Door Core Materials**

2.1.8.1. Honeycomb: Structural small cell 25mm (1") maximum Kraft paper 'honeycomb'. Weight: 36.3 (80lb) per ream (minimum). Density: 16.5kg/m^3 (1.03pcf) minimum, sanded to required thickness.
2.1.8.2. Temperature Rise Rated (TRR): Solid slab core of non-combustible, inorganic composite to limit temperature rise on the "unexposed" side of door to 250°C at 60 Minutes to ULC CAN4-S104—M80, ASTM E2074-00e1 or NFPA 252-2008.
2.1.8.3. Polystyrene: EPS polystyrene, Type 1, density: 16 to 32 kg/m3 (1 to 2 pcf), thermal values: RSI 1.06 (R 6.0) minimum, conforming to ASTM C578-09e1.

2.1.9. **Adhesives**

2.1.9.1. Heat resistant, single component, polyurethane reactive (water) hot melt, thermoset adhesive.
2.1.9.2. Rigid insulation cores: Heat resistant, epoxy resin based, low viscosity, contact cement.
2.1.9.3. Lock seam doors: fire resistant, resin reinforced polychloroprene, high viscosity sealant-adhesive.

2.1.10. **Acceptable Manufacturers**

2.1.10.1. All Steel Doors 2000 Ltd.
2.1.10.2. Artek Door (1985) Ltd.
2.1.10.3. Daybar Industries Ltd.
2.1.10.4. Fleming-Baron Door Products, an ASSA ABLOY group company.
2.1.10.5. Trillium Steel Doors Limited.
2.1.10.6. Vision Hollow Metal Limited.

2.2. Door and Frame Systems

2.2.1. **Exterior Framing**

2.2.1.1. 2.0 mm thick steel frames, fully welded; minimum 170 mm jamb depth.
2.2.1.2. Frame sizing shall be of the metric size shown in Door and Frame Schedules.

2.2.2. **Interior Frames**

2.2.2.1. For Masonry Partitions: 1.6 mm thick welded construction; knocked-down construction where Door and Frame Schedule makes reference to "suit existing construction"; minimum 170mm jamb depth factory welded.
2.2.2.2. For Drywall Partitions: 1.6 mm thick welded construction; throat size to suit partition.
2.2.2.3. Frame sizing shall be of the metric size shown in Door and Frame Schedules.

2.2.3. **Doors**

2.2.3.1. Interior: Wood by 08210.
2.2.3.2. Door sizing shall be of the metric size shown in Door and Frame Schedule or to suit existing openings.

2.3. Fabrication

2.3.1. **General**

2.3.1.1. Fit & assemble fabrication in shop where possible. Make trial assembly in shop when not possible.
2.3.1.2. Fabricate, reinforce and anchor component parts and assemblies, to support loads usage will impose without deflection detrimental to function, appearance or safety.
2.3.1.3. Reinforce components to resist stresses imposed by hardware in use.
2.3.1.4. Prepare frames and doors for specified hardware with mortises, and reinforcement. Drill and tap to template information. Incorporate steel reinforcement of
2.3.1.4.1. : 1.6 mm thick flush bolts, locks & strikes.
2.3.1.4.2. : 6.4 mm for hinges.
2.3.1.4.3. : 4.8 mm for push/pulls and panic devices.
2.3.1.4.4. : 2.7 mm thick for surface mounted hardware, and door closer brackets and arms.
2.3.1.5. Install metal mortar guards of minimum 0.76 mm thick steel at cutouts for hardware in frames installed in masonry walls.
2.3.1.6. Reinforce all frames for closers.
2.3.1.7. Provide for anticipated expansion and contraction of frames and supports.
2.3.1.8. Fit elements at intersections & joints accurately together in true planes, plumb & level.
2.3.1.9. Weld frame and door assemblies together. Weld continuously at joint exposed to view or at joints through which air or water could penetrate from the exterior of building to the interior.
2.3.1.10. Where welding is impossible, connections may be bolted. Ream drilled holes and leave exposed edges clean and smooth.
2.3.1.11. Isolate from each other dissimilar metals, and metal from concrete or masonry or prevent electrolysis.
2.3.1.12. Ensure that exterior doors and frames are tightly fitted, and drips are installed on frames of out-swinging doors, to prevent entry of water where exposed to weather.

2.3.2. **Pressed Steel Door Frames and Screen Frames**

2.3.2.1. Supply frames to suit construction conditions and dimensions indicated on drawings and in Door and Frame Schedule.
2.3.2.2. Schedule of fabrication and delivery must be such that it will not delay the project.
2.3.2.3. Fabricate interior frames of wipe coat galvanized steel and exterior frames of full galvanized sheet steel.
2.3.2.4. Fabricate steel frames in minimum thickness of 1.6 mm thick sheet steel unless otherwise specified or indicated.
2.3.2.5. Use 2.0 mm thick sheet steel for exterior frames.
2.3.2.6. Minimum frame material thickness applies only to doors not otherwise requiring heavier gauges to meet specified fire rated construction as required by validating underwriter's test.
2.3.2.7. Fabricate removable stops of minimum 0.91 mm thick steel. Do not weld stop corners.
2.3.2.8. Install recessed weatherstripping in stops of exterior doors.
2.3.2.9. Finish frame with one coat of galvanized primer on zinc coated surfaces exposed to view.
2.3.2.10. Where members join at corners, cut mitres and weld continuously along inside of sections.
2.3.2.11. Where tubular frame sections meet frame members, join by butt welding.
2.3.2.12. Attach two 1.2 mm thick steel channel spreaders at bottom of door frames to maintain square alignment, secured to facilitate removal after frames that extend only to finish floor are built in.
2.3.2.13. Incorporate structural stiffeners for frame members as shown on Drawings. Securely anchor them at bottom and top. Where they extend above ceiling, anchor to concrete or structural framing to suit site conditions.
2.3.2.14. Install 3 bumpers in interior frames at single opening latch jambs, and 2 at double door frame heads.
2.3.2.15. Fasten removable stops by countersunk Phillips head screws at approximately 225 mm o.c. symmetrically spaced on stop length.
2.3.2.16. Anchor frames at floor by 1.5 mm thick angle clips, welded to frame and provided with two holes for floor anchorage.
2.3.2.17. For frames in masonry walls attach adjustable Tee-anchors fabricated from galvanized steel same gauge as frame. Install anchors on each jamb. Install 3 anchors for openings 2285 mm high.
2.3.2.18. For frames in stud walls, weld L clip at bottom of frame for anchor to floor slabs.

2.3.3. **Steel Doors and Panels**

2.3.3.1. Fabricate steel doors and panels to a thickness of 45mm (1-3/4”). Unless indicated otherwise.
2.3.3.2. **Insulated doors and panels:**
2.3.3.2.1. Face sheets fabricated from 1.5 mm (0.06”) 16 gauge steel.
2.3.3.2.2. Insulation core: Polystyrene.
2.3.3.2.3. Longitudinal edges mechanically interlocked.
2.3.3.2.4. Adhesive assisted with edge seams visible.
2.3.3.3. **Interior doors and panels:**
2.3.3.3.1. Face sheets fabricated from 1.5 mm (0.06”) 16 gauge steel.
2.3.3.3.2. Honeycomb core.

2.3.3.3.3. Longitudinal edges mechanically interlocked
2.3.3.3.4. Adhesive assisted with edge seams visible.

2.3.3.4. **Temperature rise rated doors and panels:**
2.3.3.4.1. Face sheets fabricated from 1.3mm (0.05”) 18 gauge steel.
2.3.3.4.2. TRR asbestos free core.
2.3.3.4.3. Longitudinal edges mechanically interlocked.

2.3.3.5. Fabricate of composite metal face construction with each face formed from flush sheet steel without visible seams, free of scale, pitting, coil brakes, buckles and waves.

2.3.3.6. Formed edges shall be true and straight with minimum radius for the thickness of steel used.

2.3.3.7. Lock and hinge edges shall be bevelled 3 mm in 50 mm (1/8” in 2”) unless hardware or door swing dictates otherwise.

2.3.3.8. Top and bottom of doors shall be provided with inverted, recessed, 1.5mm (0.06”) 16 gauge steel end channels, welded to each face sheet at 50 mm (2”) on centre maximum.

2.3.3.9. Prior to shipment, mark each door with an identification number as shown on the approved submittal drawings.

2.3.3.10. Exterior doors shall be provided with factory installed flush PVC top caps. Fire labelled exterior doors shall be provided with factory installed flush steel top caps.

2.3.3.11. Blank, reinforce, drill and tap doors for mortised, templated hardware. Locate to manufacturer’s standard unless indicated otherwise.

2.3.3.12. Holes 12.7mm (1/2”) and larger shall be factory prepared.

2.3.3.13. **Glazing:**
2.3.3.13.1. For glazing materials up to and including 8 mm (5/16”) thick, doors shall be provided with 1 mm (0.04”) 20 gauge steel glazing trim and snap-in glazing stops.
2.3.3.13.2. For glazing materials greater than 8 mm (5/16”) thick, doors shall receive 1 mm (0.04”) 20 gauge steel trim and screw fixed glazing stops. Screws shall be #6 x 32mm (1 ¼”) oval head Tek™ (self-drilling) type at 305 mm (12”) on centre maximum.
2.3.3.13.3. Glazing trim and stops shall be accurately fitted (within 0.39 mm (0.015”) tolerance), butted at corners, with removable glazing stops located on the ‘push’ side of the door.

2.3.3.14. Fabricate closing stiles of paired doors as indicated or scheduled.

2.3.3.15. Where indicated in schedule, prepare doors and panels for installation of fire-rated door grilles. If required to meet door grille manufacturer’s rated design, provide reinforcement around door grill opening.

2.4. Finishing

2.4.1. File and grind exposed welds smooth so that assemblies have appearance of one piece construction. Fill depressions with metal filler and finished

2.4.2. For primed surfaces, clean, scrape and remove rust, mill scale, grease and other surface deposits from steel following fabrication. Apply full smooth coat of primer in shop. Force paint into corners and open spaces.

2.4.3. For surfaces with zinc coating, clean and smooth ground surfaces at welds, fill if necessary, and coat all areas from which galvanizing has been removed with zinc rich paint coating of 0.1 mm minimum.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Take field dimensions of construction into which fabrications of this Section are incorporated before they are fabricated. Field adaption of work fabricated in error or without field check will not be allowed without approval.

3.2. Installation

3.2.1. **Pressed Steel Frames**

3.2.1.1. Setting up of pressed steel frames in masonry walls is included in Section 06200.

3.2.1.2. Building in of pressed steel frames is included in Section 04200 of Specification.

3.2.1.3. Setting up and building in of pressed steel frames in metal stud drywall partitions is included in Section 05500 and Section 09250.

3.2.1.4. Secure frames to floor construction with two fasteners each jamb, set and brace securely to maintain true alignment until built in.

3.3. Adjustment and Cleaning

3.3.1. Refinish damaged and defective fabrications before completion. Refinish exposed surfaces to ensure that no variation in appearance is discernible.

3.3.2. Clean surfaces in preparation for specified finishing at completion of installation.

3.3.3. Final cleaning is specified in Section 01710.

End of Section

PART 1 – GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Related to this Section Performed by Other Sections

1.1.2.1. Section 07240: Composite Building Panels
Section 08460: Aluminum Curtain Wall, Screens and Entrances
Section 08800: Glass and Glazing

1.1.3. Work Performed by this Section but Specified Elsewhere

1.1.3.1. Section 07920: To specify joint sealants
1.1.3.2. Section 08800: To specify glazing

1.2. System Description

1.2.1. Tolerances

1.2.1.1. Fabricate frames to a tolerance of + 1.5mm for vertical, horizontal, and diagonal dimensions of units under 1830mm, and + 3mm for dimensions greater than 1830mm.
1.2.1.2. Erect component parts within following tolerances:
- 1.2.1.2.1. Variations from plumb: 3mm maximum variation in storey height or 3m run, cumulative
- 1.2.1.2.2. Variations from level: 3mm maximum variation in any bay or 6m run, non-cumulative
- 1.2.1.2.3. Variations from theoretical calculated plan or elevation location related to established floor lines, column lines and other fixed elements of the structure, including variations for plumb and level
- 1.2.1.2.4. Offsets in end-to-end or edge-to-edge alignment of adjoining members: 1.5mm maximum offset in any alignment

1.2.1.3. Maintain tolerances for glazing as recommended by glass manufacturer.
1.2.1.4. Maintain locations of mullions related to, and within installed tolerances, of ceilings of walls as indicated on Drawings. Verify location of ceiling grid at each floor.

1.2.2. Design

1.2.2.1. The entire window installation shall be based on the rain screen principle.
1.2.2.2. The system shall provide:
- 1.2.2.2.1. Such gaskets, baffles, overlaps and seals as required to provide a rain screen barrier to effectively deter rain water entry into cavities.
- 1.2.2.2.2. The necessary air seals to eliminate air passage from system cavities into the building and vice versa, and to assure

adequate pressure equalization of the system cavities with the outside.

1.2.2.3. The air and vapour seals required to eliminate airborne vapour infiltration from the building into the system cavities.

1.2.2.4. Openings between cavities and outside shall be sufficient cross section to provide pressure equalization. All openings must be effectively baffled to minimize direct water entry.

1.2.2.5. Thermally, the grid members shall have a resistance to heat transfer equal to or better than that of the area along the bottom of the sealed glass units.

1.2.3. **Structural Requirements**

1.2.3.1. Window systems must withstand a minimum windload of (30 psf) 1500 Pa with a maximum deflection of span/200.

1.2.4. **Performance**

1.2.4.1. Air infiltration shall not exceed 3.05 to the power of negative four cu.m/s/sq.m of curtain wall at 75 Pa pressure difference.

1.2.4.2. There shall be no water infiltration into the building under 50% of design wind load.

1.2.4.3. No condensation shall form on any interior surfaces of the aluminum members before any of the exposed area of the 25mm sealed units reaches the dew point temperature.

1.3. Quality Assurance

1.3.1. **Glazing Requirements**

1.3.1.1. Conform to recommendations of Flat Glass Marketing Association (FMGA) Glazing Manual 1980 (GM) and Glazing Sealing Systems Manual 1970 (GSSM).

1.3.2. **Contractor Qualifications**

1.3.2.1. Perform Work of this Section only by a Subcontractor approved by one of the systems manufacturers approved for this Project and who has adequate plant, equipment and skilled tradesmen to perform it expeditiously and is known to have been responsible for satisfactory installations similar to that specified during a period of the immediate past five years.

1.3.2.2. Perform Work of this Section by only one of the following Subcontractors:

1.3.2.3. Windspec Aluminum – 925 Series Rain Screen Window Material – Bronze anodized c/w extruded sills and jamb deflectors to match existing. Venting windows to be 535 Series c/w standard manufacturers hardware THPO. Approved Alternates Suppliers – Equivalent window/vent material.

1.3.2.4. Kawneer

1.3.2.5. Alwind

1.3.2.6. Alumicor

1.4. Quality Assurance

1.4.1. Requirements of Regulatory Agencies

1.4.1.1. Conform to requirements of authorities having jurisdiction in the fabrication and installation of components specified in this Section.

1.5. References

1.5.1. Reference Standards

1.5.1.1. Reference Standards quoted in Contract Documents refer to:
1.5.1.2. ASTM A167-81a, Specification for Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
1.5.1.3. ASTM A480-81, Specification for General Requirements for Flat Rolled Stainless and Heat Resisting Steel Plate, Sheet and Strip.
1.5.1.4. ASTM A525-76, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements.
1.5.1.5. ASTM A780-80, Standard Practice for Repair of Damaged Hot-Dip Coatings.
1.5.1.6. CGSB Specification 41-GP-19Ma, Rigid Vinyl Extrusions for Windows and Doors.
1.5.1.7. CGSB Specification 1-GP-108M, Paint, Acid and Alkali Resistant, Black.
1.5.1.8. CGSB Specification 1-GP-132M, Primer, Zinc Chromate, Low Moisture Sensitivity.
1.5.1.9. CGSB Specification 1-GP-181M, Coating, Zinc Rich, Organic, Ready Mix.
1.5.1.10. CAN3-G40.21-M81, Structural Quality Steel.
1.5.1.11. CSA Standard G164-M1981, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.6. Submittals

1.6.1. Shop Drawings

1.6.1.1. Submit shop drawings showing and describing in detail system assemblies, including: large scale details of members and materials, of brackets and anchorage devices, and of connection and jointing details, fully dimensioned layout for positioning of brackets and anchorage devices to structures; dimensions, gauges, thicknesses; glazing details, description of materials, including catalogue numbers, products and manufacturer's names; aluminum alloy and temper designations, metal finishing specifications; and degree of torqueing required for bolted connections; and other pertinent data and information.
1.6.1.2. Shop drawings will contain the minimum following details:
1.6.1.2.1. : jamb, head, and sill of units at junctions of facings, including air vapour seal
1.6.1.2.2. : structure required for system that is supplied with system and not part of building structure
1.6.1.2.3. : anchorage system
1.6.1.2.4. : dielectric separator details

1.6.1.2.5. : separator/slip gasket details
1.6.1.2.6. : thermal separator details
1.6.1.2.7. : flashing details

1.6.2. **Samples**

1.6.2.1. Submit samples of unit frame profiles, glass and glazed sample assembly and insulated metal panel assembly prior to fabrication of units. Sample acceptance will be for colour, appearance, glazing methods only.

1.6.2.2. Submit samples for each finish and colour required. Submit samples finished on the specified alloy on 600mm lengths of extrusions or 600mm square of sheet or plate, showing maximum range of variation in colour and shade, and matching the Architect's samples in each case. Sample submittal and acceptance shall be for colour, texture and specular gloss.

1.6.3. **Maintenance Instructions**

1.6.3.1. Submit maintenance instructions for incorporation into Project Data Book.

1.7. Delivery, Storage, and Handling

1.7.1. Suitable storage at site shall be provided by the Contractor. Parts shall be stored in this area to permit natural ventilation over their finished surfaces.

1.7.2. Under conditions of high humidity, heating or forced ventilation shall be provided to prevent the accumulation of surface moisture.

1.7.3. Deliver, handle and store units by methods approved by manufacturer. Store units at site on wood platforms raised above grade or in enclosures protected from elements and corrosive materials, and with resilient pads provided for full bearing support of frame. Stack units vertically in manner to prevent racking. Do not remove from crates or other protective covering until ready for installation.

1.7.4. Protection of this work shall be the responsibility of this Section and the methods used shall be agreed with the Contractor.

1.7.5. Do not permit foreign materials such as splashing of concrete, mortar, plaster or paint, which could damage the finish, to remain on the surface of aluminum work. All materials of this nature must be immediately removed, and where conditions are such that this will not be possible, the exposed surface of aluminum exposed to abuse shall be protected by removable aluminized vinyl protection throughout the period that work proceeds on the building. The protective materials must be carefully removed on completion of the building, and in such a manner that no damage occurs to the aluminum finish.

1.8. Warranty

1.8.1. **Extended Warranty**

1.8.1.1. Warrant installation specified in this Section covering the period of four years beyond the expiration of the warranty period specified in the General Conditions to the Contract.

1.8.1.2. Without restricting the generality of the warranty, defects shall include failure to maintain true lines, plumbness and weather tightness under all conditions.

1.8.1.3. Warrant sash balances specified in this Section covering the period for four years beyond the expiration of the warranty period specified in the General Conditions to the Contract.

1.8.2. Promptly remedy defects and/or failures upon written notification that such exist. Remedy shall include labour, materials, equipment and services required to make good defective work, and to replace such work, without removal of non-defective work, and to make good any work, components and finishes and Owner's property damaged or disturbed in course of remedying defects and/or failures.

PART 2 – PRODUCTS

2.1. Materials

2.1.1. **Aluminum**

2.1.1.1. Extrusions: AA6063-T5, alloy and temper for framing, and otherwise where not exposed to suit specified and fabricator's requirements.

2.1.1.2. Exposed Anodized Sheet and Plate: AA 5005-H14, alloy and temper, or AA1100-H14, anodizing quality.

2.1.1.3. Exposed sheets where painted: AA100-H14, alloy and temper.

2.1.1.4. Non-exposed sheets: AA3003-H14, alloy and temper, mill finish, or Alcan "Utility Sheet".

2.1.1.5. Exposed surfaces of aluminum shall be free of die marks, scratches, blisters, "leave-off" marks, or other blemishes which are visible.

2.1.2. **Steel**

2.1.2.1. Steel Sheet: Galvanized steel sheet to meet specified requirements of ASTM Specification A525, zinc coating designation ZF275.

2.1.3. **Stainless Steel**

2.1.3.1. ASTM Specifications A480-81, and A167-81a, Type 304.

2.1.4. **Finishes**

2.1.4.1. Anodic bronze coating, Architectural Class 1, AA-M12C22A41 (.0004")

2.1.5. **Glass**

2.1.5.1. To meet specified requirements of Section 08800; 25mm sealed insulating glass units and single glazing and as specified herein.

2.1.6. **Glazing Gaskets**

2.1.6.1. Either neoprene of EPDM (ethylene propylene diene monomer) with dimensional tolerances and durometer hardness and of suitable size and shape to meet requirements of the specifications and their specific application. Gaskets shall be virgin material as manufactured by Tremco Manufacturing Company (Canada) Limited or other approved manufacturer. Gaskets shall conform to Tremco Information Bulletins:
2.1.6.2. For EPDM – TDB-460-1 or equal.
2.1.6.3. For Neoprene – TDB-270-1 or equal.

2.1.7. **Glazing Tape**

2.1.7.1. Polyisobutylene, with continuous molded-in synthetic rubber shim, in colour selected, Polyshim Tape by Tremco (Canada) Limited, or equivalent as approved.

2.1.8. **Sealants and Sealant Materials**

2.1.8.1. To meet specified requirements of Section 07920 and design performance requirements.

2.1.9. **Fastenings**

2.1.9.1. Stainless steel, Type 300 series, or double cadmium plated steel, selected to prevent galvanic action between fasteners and components fastened. Where exposed in finished surfaces, use oval-head countersunk Phillips head screws with shank diameter one screw size smaller than the diameter of holes in fastened material, and colour to match adjacent surfaces.

2.1.10. **Exposed Anchors**

2.1.10.1. Aluminum or stainless steel with aluminum materials; and otherwise to match metal anchored. Non-exposed: as for exposed or may be galvanized steel.

2.1.11. **Bituminous Paint**

2.1.11.1. To meet specified requirements of CGSB Specification 1-GP-108.

2.1.12. **Separator/Slip Gaskets**

2.1.12.1. Nylon as suitable for connection detail at moving faces of connections.

2.1.13. **Thermal Separator**

2.1.13.1. Solid extruded and thermally resistant sections with a durometer hardness of Shore "A" 50, ±5.

2.1.14. **Supporting Angles, Plates, Bars, Rods and Other Steel Accessories**

2.1.14.1. Mild steel CNA3-G40.21-M78, thickness as required to sustain imposed loads and in no case less than 4.8mm thick.
2.1.14.2. Galvanize steel after fabrication where installed on exterior side of vapour retarder/air barrier. Prime paint steel where installed on interior side of vapour retarder/air barrier.

2.1.15. **Thermal Insulation**

2.1.15.1. Rigid glass fibre board, AF530 wall insulation manufactured by Fiberglass Canada Inc. in thickness indicated on Drawings with black coating on outer surface.
2.1.15.2. Loose Insulation: Glass fibre, density of 12 kg/cu.m by Fiberglass Canada Inc.

2.1.16. **Foam Insulation**

2.1.16.1. One or two part, polyurethane, with a nominal density of 40 kg/m^3, coefficient of linear expansion of 0.00006 mm/m/C, water vapour transmission of 73 Ng/Pa5m^2 and thermal conductivity of 0.02 W/mK.
2.1.16.2. Similar to products as produced by BASF Canada Inc.

2.1.17. **Aluminum Sills**

2.1.17.1. Extruded aluminum sections, of same thickness and of same finish and colour as window framing.

2.1.18. **Hardware**

2.1.18.1. 619 nickel finish

2.1.19. **Screens**

2.1.19.1. To CGSB 79 – GP - #1IM
2.1.19.2. Fiberglass mesh in an independent, removal aluminum frame, positioned in between vertical double hung slider units, or interior face for awning units, or exterior face for hopper units.

2.2. Products

2.2.1. Specified manufacturers' catalogue references to Windspec Inc. establish the minimum standards for the products listed in this Section.

2.2.2. Unspecified materials which form a part of completed assemblies shall be of manufacturers' standard.

2.2.3. Products of the following manufacturer are considered as acceptable alternatives, provided that they meet the minimum requirements of the products listed and must submit technical literature, samples, drawings and performance data for comparison:
2.2.3.1. Kawneer
2.2.3.2. Alwind Industries Ltd.
2.2.3.3. Alumicor

2.2.4. **Fixed Framing**

2.2.4.1. Framing: 2200 Series thermally Broken Curtain Wall System
2.2.4.2. Frame Depth: 100mm
2.2.4.3. Material Thickness: .070 inches
2.2.4.4. Finish: clear anodized
2.2.4.5. Glazing: Insulating glass units. Refer to drawings and Section 08800 for types, locations and details
2.2.4.6. Spandrel Panels: Refer to drawings and Section 08800 for types, locations and details.
2.2.4.7. Sills: extruded, aluminum sills, clear anodized finish.

2.2.5. **Projected Ventilator Windows**

2.2.5.1. Framing: 2200 Series thermally Broken Curtain Wall System
2.2.5.2. Frame Depth: 100mm
2.2.5.3. Material Thickness: .070 inches
2.2.5.4. Style: Top hinged, projected out
2.2.5.5. Finish: clear anodized
2.2.5.6. Glazing: Insulation glass units, Refer to drawings and Section 08800 for types, locations and details
2.2.5.7. Screens: as specified to fit on interior face
2.2.5.8. Hardware: at each vent provide the following items:
2.2.5.8.1. : 2 – heavy duty four bar hinges with restrictors to prevent projection of window frame out by more than 100mm
2.2.5.8.2. : 2 – cam handles
2.2.5.8.3. : 2 – strikes (keeper). To be approved by the Architect.
2.2.5.8.4. : 1 – under screen push bar
2.2.5.9. Units shall include drip deflectors to prevent the infiltration of wind driven rain at the perimeter of the operable vents.
2.2.5.10. Weather stripping: two lines of extruded elastomeric weather stripping retained in extruded splines in window frame and on all four sides of each vent.

2.3. Fabrication

2.3.1. Ensure glazing rebate provided with depth and width to accommodate specified glass in accordance with glass manufacturer's recommendations. Install glazing gaskets anchored to aluminum extrusions.

2.3.2. Provide structural support for air barrier tie-in.

2.3.3. **Framing Members**

2.3.3.1. Fabricate generally to dimensions/profiles indicated on drawings. Meet specified requirements and clearances to other construction components.
2.3.3.2. Reinforce members and joints with steel plates, bars, rods or angles for rigidity and strength as needed to fulfill performance requirements. Use concealed stainless steel fasteners for jointing that cannot be welded.
2.3.3.3. Provide glass setting, supports and stops to minimize possibility of glass breakage caused by structural inadequacy of frames, stops and frame joints, solar and thermal induced forces, within limitations of specified design performance criteria, as recommended by glass manufacturer.
2.3.3.4. Design system to ensure that site glazing may be performed in accordance with the construction schedule and within the environmental limitations specified in Section 08800.

2.3.4. **Assembly of Units**

2.3.4.1. Join members by welding where specified and otherwise where practicable.
2.3.4.2. Join members where specified, and otherwise where welding is impracticable, by mechanical methods. Reinforcement or fasteners visible on faces of members where exposed to view will not be acceptable.
2.3.4.3. Weld with electrodes and by methods recommended by the base metal manufacturer, and in accordance with CSA Standards W47.1, W47.2 and W59 as applicable, and to avoid distortion or discolouration of exposed faces. Make welds continuous unless otherwise shown.
2.3.4.4. Grind exposed welds flush, to match adjacent metal.
2.3.4.5. Join members in shop fabricated units to fit flush with hairline joints.
2.3.4.6. Incorporate weepholes to drain off pocketed water. Baffle to prevent entry of driven water to conform to specified performance.
2.3.4.7. Except where shipping makes impossible, fabricate units in shop and ship completely assembled.

2.3.5. **Vapour Retarder and Air Barrier**

2.3.5.1. Maintain integrity of vapour retarder and air barrier system within systems installed by this Section and between systems and adjoining construction.

2.3.6. **Dissimilar Materials**

2.3.6.1. Protect material from electrolytic action when dissimilar metals are in contact with one another with two coats of bituminous paint or other approved means.
2.3.6.2. Protect aluminum concealed in contact with masonry with two coats of bituminous paint.

2.3.7. **Anchors**

2.3.7.1. Incorporate anchorage to structure to support units adequately when subjected to specified loads.

2.3.7.2. Allow for complete adjustment in anchorage for levelling and positioning of units during installation.

2.3.8. **Fastenings**

2.3.8.1. Where fastenings are exposed to dampness or moisture, use cadmium plated steel for steel-to-steel, aluminum for aluminum-to-aluminum, and stainless steel otherwise or alternatively for all above.
2.3.8.2. Where fastenings are not exposed to dampness or moisture, cadmium plated steel may additionally be used for all combinations of metals noted in immediately preceding sub-paragraph.

2.3.9. **Thermal Movement**

2.3.9.1. Fabricate exterior units and assemblies to provide for expansion and contraction of component members and between units when subjected to surface temperatures from -34 deg C to 82 deg C.

2.3.10. **Mullions**

2.3.10.1. Fabricate mullions to provide for specified thermal movement without damage to adjacent units.

2.3.11. **Dissimilar Materials**

2.3.11.1. Protect material from electrolytic action when dissimilar metals are in contact with one another.
2.3.11.2. Protect aluminum concealed in contact with masonry with a heavy coating of bituminous paint.

2.3.12. **Anchors**

2.3.12.1. Incorporate anchorage to structure for units at sills, heads and jambs on 450mm centres generally, and to support units adequately when subjected to specified loads.
2.3.12.2. Allow for complete adjustment in anchorage for levelling and positioning of units during installation.

2.3.13. **Attachment of Hardware**

2.3.13.1. Match hardware fastenings to metal of hardware.
2.3.13.2. Attach hardware by bolts or machine screws into tapped reinforcing plates.

2.3.14. **Weatherstripping**

2.3.14.1. Secure weatherstripping in place by mechanical means or into formed recesses with keys, and in a manner to enable its removal and replacement without special tools.
2.3.14.2. Ensure that continuity of weatherstripping is maintained around openings.

2.3.15. **Thermal Break**

2.3.15.1. Incorporate a thermal break in frames.

2.3.16. **Finishing**

2.3.16.1. For surfaces with zinc coating, clean and smooth ground surfaces at welds and prime areas from which zinc has been removed with a coating of zinc rich paint of minimum 0.102mm thickness. Immediately following damage to galvanized protection prepare and repair surfaces to meet specified requirements of ASTM Specification A780.

2.3.17. **Sills**

2.3.17.1. Fabricate sills of extruded aluminum as indicated on drawings and finish as specified for frames.
2.3.17.2. Include jamb deflectors.
2.3.17.3. Fabricate sills in minimum length of 3650mm or as required by openings or closing lengths. Include cover and splice plates at joints. Sills shall extend full length of any masonry opening on which they are seated.
2.3.17.4. Prefabricate mitred, reinforced and sealed corner sections.
2.3.17.5. Incorporate for concealed anchorage of sills, and means for adjustment of level and positioning during installation.

2.3.18. **Horizontal Metal Siding**

2.3.18.1. Fabricate portions of the work to incorporate requirements for horizontal metal siding where shown on the Drawings.

PART 3 – EXECUTION

3.1. Examination

3.1.1. Take critical site dimensions to ensure that adjustments in fabrication or installation are provided for, that allowance is made for possible deflection of structure at heads, and that clearances to other construction have been maintained.

3.1.2. Ensure that anchors and inserts, installed by others, are adequate to meet specified requirements, and make adaptations before installation.

3.2. Installation

3.2.1. **General**

3.2.1.1. Coordinate fabrication of components specified in this Section with requirements of other Sections to ensure proper anchorage and fitting.
3.2.1.2. Install components and units plumb, level and in accordance with shop drawings, by qualified experienced tradesmen and to conform to fabricator's instructions at location of testing and at site.

3.2.1.3. Do not force units into place, nor superimpose on them loads for which they were not designed.
3.2.1.4. Coordinate with Other Contractors, make provisions, and install vapour retarder and air barrier to ensure complete continuity and integration of vapour retarder and air barrier system.
3.2.1.5. Provide structural support for air barrier to prevent its displacement or its loss of seal when subjected to forces specified for design performance.
3.2.1.6. Install metal flashing to drain cavities in system. Secure flashings permanently to prevent displacement, leaks, and noise.
3.2.1.7. Provide for thermal movement to take place between shop fabricated assemblies and between assemblies and adjacent construction.
3.2.1.8. Secure units by non-corrosive anchorage materials. Use of wood or fibre is not acceptable.
3.2.1.9. Conceal anchors, clips, blocking, and all other attachments.
3.2.1.10. Install reinforcing and supporting members as indicated and required structurally as part of the work of this Section.
3.2.1.11. Seal metal-to-metal joints between components included in the work of this Section to ensure a weather-tight assembly, and in accordance with sealant manufacturer's specifications.
3.2.1.12. Install insulation where aluminum is exposed to the exterior to ensure that thermal conductance to interior of building is no more than thermal conductance of insulating glass units.
3.2.1.13. Install units with consideration for finish variations. Abrupt variations of appearance or colour in adjacent components will not be acceptable without approval before installation.
3.2.1.14. Coat all damaged prime painted surfaces of anchorage with rust inhibiting paint after welding in completed.
3.2.1.15. Apply two coats of zinc rich paint to metal surfaces bared by removal of galvanizing.
3.2.1.16. Apply one coat of prime paint to metal surfaces bared by removal of shop applied primer.

3.2.2. **Operable Windows**

3.2.2.1. Install windows plumb, level and in accordance with shop drawings, by qualified experienced workers and to conform to fabricator's instructions.
3.2.2.2. Do not force window units into place, nor superimpose on them loads for which they were not designed.
3.2.2.3. Provide for thermal movement to take place between windows and adjacent construction.
3.2.2.4. Secure windows by non-corrosive and inorganic anchorage materials.
3.2.2.5. Conceal anchors, clips, blocking, and all other attachments.
3.2.2.6. Install reinforcing and supporting members as specified or indicated for units specified in this Section.

3.2.3. **Caulking**

3.2.3.1. Caulk joints between frame members and sills and adjacent construction as a part of the work of this Section and in accordance with Section 07921 of the specifications.

3.2.4. **Glazing**

3.2.4.1. Install glass and composite building panels in units, as part of work of this Section and in accordance with Sections 07240 or Section 08800 of these specifications. Include manufacturer's standard glazing components to create prime seals.

3.3. Adjustment and Cleaning

3.3.1. **Adjusting**

3.3.1.1. Adjust operating units to operate smoothly and fit tightly when closed and locked.
3.3.1.2. Adjust hardware to operate smoothly, with proper tension and lubricate.
3.3.1.3. Ensure that weatherstripping does not cause binding to prevent closing and locking, and that it makes weather tight contact.

3.3.2. **Cleaning on Completion of Installation**

3.3.2.1. Remove deposits which affect appearance or operation of units.
3.3.2.2. Remove protective materials.
3.3.2.3. Clean interior and exterior surfaces by washing with clear water or with water and soap or detergent; followed by a clear water rinse.
3.3.2.4. Clean and restore stained metal surfaces in accordance with manufacturer's recommendations. Replace if cleaning is impossible.
3.3.2.5. Final cleaning is specified in Section 01710.

3.4. Protection

3.4.1. Immediately upon completion of installation, suitably protect vulnerable edges, and exposed corners and surfaces. Protection shall prevent damage by mortar, paint or other hazards form the work of other trades.
3.4.2. Project prefinished surfaces of metal with protective coatings or wrappings to remain in place until construction completion. Use materials recommended by finishers or manufacturers of metals to ensure that method is sufficiently protective, easily removed, and harmless to finish.
3.4.3. Remove protection from metal glazing surfaces before installation of glass.
3.4.4. Maintain protection from time of installation to final cleanup in accordance with Sections 01040 and 01500.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. **General Requirements**

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

1.1.2. **Work performed by other Sections Related to this Section is specified in**

Section 06410: Cabinet hardware as specified by schedule.

1.1.3. **Hardware Specified This Section, Supplied Only, Installed by Other Sections**

Section 06200: Finish Carpentry: To install hardware other than as specified.

1.1.4. Selected hardware supplier will become a Subcontractor of the Contractor.

1.2. Quality Assurance

1.2.1. Requirements of Regulatory Agencies:
Install only ULC or ULI listed hardware for fire rated doors and frames.

1.3. Submittals

1.3.1. **Samples**

1.3.1.1. Submit samples of each hardware item.

1.3.2. **Templates**

1.3.2.1. Submit templates to Contractor for use by installers and fabricators as required for proper location and installation of hardware.

1.3.3. **Maintenance and Operating Instructions**

1.3.3.1. Submit maintenance, operating and installation instructions for installation purposes and for incorporation in Project Data Book.

1.4. Delivery, Storage, and Handling

1.4.1. Package hardware and label with description of contents and installation location. Refer to hardware list designation, and with door number when applicable.

1.4.2. Deliver hardware to location at building site designated by Contractor.

1.5. Warranty

1.5.1. **Extended Warranty**

1.5.1.1. Warranty contained in GC24 is, with respect to Section 08710, extended from 1 year to 5 years.

1.5.1.2. Contractor hereby warrants that system is suitable for use in this type of installation.

1.5.1.3. Contractor shall arrange with Architect and/or Owner, about 1 month before warranty expires, to visit site, examine the hardware, and make necessary repairs. Should Contractor fail to make such arrangement through no fault or neglect of Owner or Architect, then period of warranty shall extend to one month after such arrangement is made.

PART 2 - PRODUCTS

2.1. Products

2.1.1. Finish hardware fabricated of same materials shall have consistent colour and finish throughout Project.

2.1.2. Supply with specified hardware screws, bolts, expansion shields, inserts, and other items and parts required for complete installation and functioning.

2.1.3. Reference Hardware Group List for types of hardware used on this project.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Before supplying materials, ensure by a check of Drawings, shop drawings and details prepared for the Project, that listed hardware is suitable by dimension and function for intended purpose. Inform Architect of discrepancies.

3.2. Installation

3.2.1. Provide instructions required for preparation of doors and frames to the appropriate fabricators.

3.2.2. Provide instructions required for installation of hardware to Section 06200, and other Sections as applicable.

3.2.3. Provide assistance and supervision of installation when requested.

3.3. Adjustment

3.3.1. Verify that installed hardware functions properly, and instruct installers accordingly of requirements and procedures for adjustments to ensure satisfactory operation.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. This Section specifies work which shall be performed by:

Section 08440: Aluminum Framed Glazing Systems

1.2. References

1.2.1. Reference Standards

1.2.1.1. Reference Standards quoted in Contract Documents refer to:
1.2.1.2. CAN/CGSB-12.20 - M89
1.2.1.3. CAN/CGSB-12.1-M79, Glass, Safety, Tempered or Laminated.
1.2.1.4. CAB/CGSB-12.3-M76, Glass, Polished Plate or Float, Flat, Clear.
1.2.1.5. CAN/CGSB-12.8-M76, Insulating Glass Units.
1.2.1.6. CAN/CGSB-12.10-M76, Glass, Light & Heat Reflecting
1.2.1.7. CGSB Specification 19-GP-5M, Sealing Compound, One Component, Acrylic Base, Solvent Curing.
1.2.1.8. CAN/CGSB-19.13-M82, Sealing Compound, One Component, Elastomeric, Chemical Curing.
1.2.1.9. CAN/CGSB-10.24-M80, Sealing Compound, Multi-Component, Chemical Curing.

1.3. Submittals

1.3.1. Submit Samples in accordance with section 01300

1.3.2. Submit two 216 mm x 280 mm samples of each specified type of glass, including tinted glass.

1.4. Site Conditions

1.4.1. Environmental Conditions

1.4.1.1. Proceed with glazing only when glazing surfaces are accumulating no moisture from rain, mist of condensation.
1.4.1.2. When temperature of glazing surface is below 4°C, obtain approval of glazing methods and protective measures which will be used during glazing operations.

1.5. Warranty

1.5.1. **Extended Warranty, Insulating Glass Units**

1.5.1.1. Warrant insulating glass covering the period for four years beyond the expiration of the warranty period specified in the General Conditions to the Contract. Without restricting the generality of warranty, defects shall include
: warping of spacer blocks;
: dust or film of fogging formation on internal glass surfaces resulting from any cause except glass breakage;
: glass breakage except form impact by solid objects, or cause by failure of unit edge binding or of framing within limitations of specified performance criteria.

1.5.1.2. Contractor agrees to make good defects and replace defective units. Replacement shall include removal of defective unit and installation of replacement unit. Fogging of glass inside sealed units will be considered sufficient evidence of loss of seal.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Label each piece of glass, and each container of glazing compound or sealant to indicate manufacturer, type, and quality. Leave labels on glass until final cleaning.

2.1.2. **Glass:**

2.1.2.1. **Single Glazed Interior Units**
- 2.1.2.1.1. Warm edge,
- 2.1.2.1.2. IGMAC Certified.
- 2.1.2.1.3. Float
- 2.1.2.1.4. Glass Thickness: 6mm minimum or as required to meet design requirements.
- 2.1.2.1.5. Glass Type: Tempered as required to meet design requirements.

2.1.2.2. **Insulating Glass Units:**
- 2.1.2.2.1. Warm edge, hermetically sealed, minimum 13 mm air space - air filled, double sealed (primary to be polyisobutylene, secondary to be polysulphide or structural silicone glazed units), desiccant filled Bayform “Thermal Edge” spacer (black) with splice connectors at corner of each glass unit.
- 2.1.2.2.2. IGMAC Certified.
- 2.1.2.2.3. Low E coating:
- 2.1.2.2.4. Acceptable Products:
  - 2.1.2.2.4.1. AGC/AFGD’Comfort Ti-AC 40'
  - 2.1.2.2.4.2. PPG ‘Solarban 60'
  - 2.1.2.2.4.3. Cardinal ‘LoE2 -172'
  - 2.1.2.2.4.4. Versalux
  - 2.1.2.2.4.5. Viracon ‘Solarscreen 2000 VE 1-2M’
- 2.1.2.2.5. Glass Thickness: 6mm minimum or as required to meet design requirements.
- 2.1.2.2.6. Glass Type: Annealed, heat strengthened, or tempered as required to meet design requirements.

2.1.2.3. **Performance Requirements:**
- 2.1.2.3.1. Visible light: 68 - 70%.
- 2.1.2.3.2. Winter night-time Metric U-value = 1.7
- 2.1.2.3.3. Shading Coefficient: within 0.43 - 0.46.
- 2.1.2.3.4. Solar heat gain coefficient: within 0.37 - 0.40.
- 2.1.2.3.5. Glass Colour: Tinted, unless otherwise noted.
- 2.1.2.3.6. Light Bronze as selected by the architect.
- 2.1.2.3.7. **Type 1** exterior lite: tinted, tempered, body colour by architect.
- 2.1.2.3.8. interior lite: clear, low emissivity coating on third surface
- 2.1.2.3.9. Type 2 exterior lite: tinted, tempered, body colour by architect
- 2.1.2.3.10. interior lite: clear, tempered, low emissivity coating on third surface of interior lite

2.1.2.4. **Wired Glass**:
- 2.1.2.4.1. Polished Georgian wired plate, to CAN/CGSB-12.11M90, type 1 wire mesh style 6mm thickness. As and where noted GL-6 - Sand blasted with clear coat finish.

2.1.2.5. **Heat Treated Safety Glass**:
- 2.1.2.5.1. Tempered glass to meet specified requirements of CAN/CGSB-12.1-M90 for Types 1 and 2 transparent and tinted, Herculite K, by PPG Canada Inc.
- 2.1.2.5.2. Tempering shall be performed in a convection type oven.
- 2.1.2.5.3. Tempering and heat strengthened glass shall be treated prior to application of reflective or paint coatings.
- 2.1.2.5.4. Tempered glass tempered to minimize distortion. Roll-wave distortion not to exceed 0.127mm from peak to valley.
- 2.1.2.5.5. Orient tempered glass in manner to achieve consistent appearance.
- 2.1.2.5.6. Thickness: 6mm

2.1.2.6. **Annealed (float) glass**:
- 2.1.2.6.1. Clear, annealed glass, 6mm thick minimum as required to meet design requirements. To CAN/CGSB-12.3 - M 91, Glazing Quality. As and where noted - Acid Etched or sand blasted with clear coat finish.

2.1.2.7. **Mirrors:**
- 2.1.2.7.1. Annealed glass to ASTM C 1503.
- 2.1.2.7.2. Grade: Mirror cut size.
- 2.1.2.7.3. Quality: Mirror select quality, allowable distortion shall be less than 80degrees vision interference angle to ASTM 1036-01.
- 2.1.2.7.4. Colour: Clear
- 2.1.2.7.5. Thickness: 6mm.
- 2.1.2.7.6. Exposed edges shall be ground and polished.

2.1.2.8. Products supplied by AFG Glass Inc. are considered as acceptable alternatives.

2.1.2.9. **Glazing Accessories**
- 2.1.2.9.1. Glazing Gaskets: Preformed, EPDM, Silicone comapatible, to ASTM C864 and ASTM C1115. Eternaflex by Gibson-Homans Co., Parlfex by Parr Sealants, 303 Glazing Tape by P.T.I. Sealants Limited, or Tremco 440 by Tremco (Canada) Ltd.
- 2.1.2.9.2. Setting Blocks: Neoprene, of durameter hardness of Shore "A" 40 to 50.

2.1.2.9.3. Spacer Shims: Neoprene, of durameter hardness of Shore "A" 40 to 50.

2.1.2.9.4. Safety Film: 14 mil. Security Film, Armourcoat Glass Guard as supplied by Ultimate Reflections - Contact: Scott Hagle (519)476-8584 or (519)690-2636.

2.1.2.9.5. Glass Clamps: CRL - Z series glass clamps 10mm - 12mm glass thickness. Brushed Nickle as supplied by C.R. Laurence.

2.1.2.10. **Glazing Sealants**

2.1.2.10.1. Any of the following specified sealants as utilized for approved glazing system will be acceptable.

2.1.2.10.2. Incorporate sealants as incorporated in manufacturer's standard glazing systems as approved.

2.1.2.10.3. Ensure that glazing sealants are completely compatible with insulating glass unit sealants.

2.1.2.10.4. One Part Acrylic Glazing Sealant: To meet specified requirements of CGSB Specification 19-GP-5, in glazing hardness grade.

2.1.2.10.5. One Part Silicone Glazing Sealant: To meet specified requirements of CAN/CGSB-19.13-M82, in glazing hardness grade.

2.1.2.10.6. One Part Polysulphide Glazing Sealant: To meet specified requirements of CAN/CGSB-19.13-M82, in glazing hardness grade.

2.1.2.10.7. Two Part Polysulphide Sealant: To meet specified requirements of CAN/CGSB-19.24-M80, in glazing hardness grade.

PART 3 - EXECUTION

3.1. Installation

3.1.1. **General**

3.1.1.1. Install materials in accordance with manufacturer's specification, and ensure that each material in a glazing system is compatible with the others.

3.1.1.2. Ensure that projections have been removed from rebates and that sufficient width and depth clearances are provided for specified glass.

3.1.1.3. Remove stops and store during glazing to avoid damage to them.

3.1.1.4. Remove excess glazing sealants from adjacent surfaces, including glass, during working life of material, and by methods not harmful to the surfaces.

3.1.1.5. Collect broken glass and cuttings in boxes and remove from site.

3.1.1.6. Do not set any glass without glazing beds or gaskets.

3.1.2. **Glass**

3.1.2.1. Install glass in thicknesses to comply with Ontario Building Code requirements.

3.1.2.2. Cut glass to fit openings and to allow clearances which will ensure that glass is held firmly in place and is not subjected to stresses.

3.1.2.3. Ensure that glass edges are clean cut, not nipped or seamed.

3.1.2.4. Do not cut or nip tempered glass to fit. Replace oversize or flared lights with entirely new units of proper dimensions.

3.1.3. **Glazing Preparation and Methods**

3.1.3.1. Clean glazing rebate surfaces of all traces of dirt, dust, or other contaminants.
3.1.3.2. Use glazing sealants without addition of thinners and from only containers with seals unbroken until opened for use.
3.1.3.3. Prime all glass rebates for materials affected.
3.1.3.4. When glazing commences, arrange for the presence of a technical representative of the glazing materials manufacturer to advise on procedures and methods.
3.1.3.5. Ensure that glazing sealants and tapes are in full contact with glazing surfaces.
3.1.3.6. Tool gunned sealants with a slight bevel away from glass faces.

3.1.4. **Positioning Glass**

3.1.4.1. Support glass, in lights of over 2540 mm perimeter, by two setting blocks, one at each quarter point of each light.
3.1.4.2. Center glass in rebates. Use spacer shims in lights of over 2540 mm perimeter. Set shims on all four sides of lights at a maximum of 300 mm from the ends and 600 mm o.c. in between.

3.1.4.3. Set shims to allow a space of no less than 6 mm between shim edges and sight lines.
3.1.4.4. Spacer shims are not required where glazing tape is used.

3.1.5. **Bedding at Fixed Stops**

3.1.5.1. Apply sealants in sufficient beads that when glass is pressed into place they ooze out slightly.
3.1.5.2. Cut tapes of full depth of stop accurately to length on a work table. Set sill and head tapes first at full length of rebated opening. Butt jamb tapes into sill and head tapes tightly to weld them together. Remove protective paper backing only when glass is ready for setting, and ensure that butted joints of tape are positively filled with applied sealant.
3.1.5.3. Cut tapes accurately to length on a work table and install in a width less than stop height, so that tape edges are held 5 mm behind sight lines. Set sill and head tapes first at full length of rebated opening. Butt jamb tapes into sill and head tapes tightly to weld them together. Remove protective paper backing only when glass is ready for setting, and ensure that butted joints of tape are positively filled with applied sealant. After glass is set, fill void over top of tape to sight line by gunning in topping sealant.
3.1.5.4. Apply heel beads of sealant between edges of glass and frame, except at insulating or heat absorbent glass exceeding 2540 mm perimeter. Fill voids entirely with heel bead, and to ensure a minimum bite on glass of 5 mm.
3.1.5.5. Apply heel beads at insulating and heat absorbing glass, at lights exceeding 2540 mm perimeter to fill entire voids under glass at sills and for slight distance up each jamb, and at remaining perimeter of lights, in a bead only partially filling void and into which removable stops are set. Ensure a minimum 5 mm bite on glass at each heel bead.

3.1.6. **Bedding at Stop Beads**

3.1.6.1. Apply sealants to glazing face of stop. Press stops into place using spacer shims, and tool sealant at a slight bevel away form glass face. Fasten stops if design requires.

3.1.6.2. Apply tape to removable stops as specified for fixed stops and with top of tapes held 5 mm behind sight lines. Press stops into place and fasten if design requires. Fill void over top of tape to sight line by gunning in topping sealant, and tool to slight bevel away from glass face.

3.1.7. **Adjustment and Cleaning**

3.1.7.1. Replace scratched, etched, or defective glazing resulting from manufacture, setting, handling, or storage before or during installation. Glass accidentally broken or physically damaged, by other than faulty glazing or materials, after glazing by this Section has been completed shall be replaced as specified in Section 01710.

3.1.7.2. Final cleaning of glass is specified by Section 01710.

3.1.7.3. Remove stains, deposits, marks or blemishes caused by this Section from surfaces of all materials exposed to view. Replace materials that cannot be cleaned to appear as new.

3.1.8. **Protection**

3.1.8.1. Following glazing, mark each light of glass, except heat absorbing, to indicate its presence with a material, easily removable and harmless to glass.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section is Specified in:

Section 07920: Sealants and Caulking
Section 09510: Acoustic Ceilings
Section 09900: Painting and Finishing

1.1.3. Supply of Work Installed by This Section is Specified in:

Division 15: To furnish access panels.

1.2. System Description

1.2.1. Tolerances

1.2.1.1. Install board within 3 mm of dimensioned location unless approved otherwise, and flat to a tolerance of 1 mm maximum in 1000 mm and 1 mm maximum in any running 200 mm.
1.2.1.2. Install framing members to ensure that deflection of each member does not exceed 1/360 of its span under dead load and loads imposed by mechanical and electrical equipment and fixtures supported by ceiling.

1.3. Quality Assurance

1.3.1. Requirements of Regulatory Agencies

1.3.1.1. Install fire separations and fire protection exactly as specified in Underwriters' Laboratories test design specification that validates specified rating. Verify installations specified in other Sections, as a part of the entire assembly, meets applicable validating test design specification.

1.4. References

1.4.1. Reference Standards

1.4.1.1. Reference standards quoted in Contract Documents refer to:
1.4.1.2. ASTM A116-81, Specification for Zinc Coated (Galvanized) Iron or Steel Farm Field and Railroad Right-of-Way Wire Fencing.
1.4.1.3. ASTM 153-80, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
1.4.1.4. ASTM A525-81, Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, General Requirements.
1.4.1.5. ASTM C475-64, Standard Specification for Joint Treatment Materials for Gypsum Wallboard Construction.
1.4.1.6. ASTM C646-76a, Specification for Steel Drill Screw for the Application of Gypsum Sheet material to Light-Gauge Steel Studs.
1.4.1.7. CGSB Specification 1-GP-118M Finish, Interior, Alkyd, Flat.

1.4.1.8. CAN/CSA-A82.27-M91, Gypsum Board.
1.4.1.9. CAN/CSA-A82.31-M91, Gypsum Board Application.

1.5. Delivery, Storage, and Handling

1.5.1. Package finish materials.

1.5.2. Store materials in protected dry areas. Store board flat in piles with edges protected.

1.5.3. Ensure that finish metal members are not bent, dented, or otherwise deformed.

1.5.4. Deliver products supplied only by this Section to those responsible for installation, to the place they direct, and to meet installation schedules.

1.5.5. Package fire rated materials with Underwriters' Laboratories labels attached.

1.6. Site Conditions

1.6.1. **Environmental Requirements**

1.6.1.1. Install interior gypsum board systems only in areas closed and protected against weather, and maintained between 10 deg C and 21 deg C. In cold weather, ensure that heat is introduced in sufficient time, before installation commences, to bring surrounding materials up to these temperatures and that it is maintained until materials installed by this Section have cured.
1.6.1.2. Do not install gypsum board systems in any area unless satisfied that construction in place has dried out, and that no further installation of damp materials is contemplated.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. **Gypsum Board**

2.1.1.1. To meet specified requirements of CAN/CSA-A82.27.
2.1.1.2. Plain Gypsum Board: With tapered edges.

2.1.2. **Joint Materials**

2.1.2.1. **Gypsum Board Joint Reinforcing Tape:** 50 mm wide glass, fibre mesh.
2.1.2.2. **Fiberbond Joint Reinforcing Tape:** 50 mm wide, cross laminated fibre tape.
2.1.2.3. **Gypsum Board Joint Compounds:**
2.1.2.3.1. Latex, resin base, possessing good adhesion, mixed with fresh, unadulterated water having no detrimental effect on compounds.
2.1.2.3.2. Durabond 45 in powder form to be mix on site in accordance with Manufacturer’s printed instructions

2.1.3. **Galvanizing**

2.1.3.1. **Zinc Coating:** To meet specified requirements of ASTM Specifications A525, zinc coating designation Z275 for sheet steel; A153, Class B.3 Coating for hardware and bolts; A116, Class 3 Coating for wire and rods.
2.1.3.2. **Wiped Coating:** ASTM Specification A525 zinc coating designation ZF75.
2.1.3.3. **Hot Dipped:** Zinc coating by hot dipping after fabrication to provide a uniform coating of not less than 2.0 ounces per square foot.

2.1.4. **Fastenings and Ties**

2.1.4.1. Screws: For securing gypsum board to metal furring: Self-drilling, self-tapping, case-hardened, Phillips head, drywall screws, with corrosion resistant finish; to meet requirements of ASTM Specification C646. #6 x 25 mm for single thickness board fastening, and #7 x 41 mm for double thickness board fastening.
2.1.4.2. Tie Wire: 1.6 mm dia. galvanized soft annealed steel wire.

2.1.5. **Furring System**

2.1.5.1. **Runner (Carrying) Channels:** 1.6 mm thick cold rolled steel, prime painted.
:38 mm x 13 mm where supported at centers of 900 mm maximum.
:38 mm x 19 mm where supported at centers of 1200 mm maximum.
2.1.5.2. **Furring Channels:** 0.55 mm thick cold rolled steel, wiped coated, nominal size of 19 mm deep x 32 mm face, hat type with knurled face.
2.1.5.3. **Metal trim:** 13 mm, J - trim, no. 200-A; 13 mm, L - trim, No. 200-B, both as manufactured by Canadian Gypsum Company Inc.
2.1.5.4. **Control Joints:** No. 093 as manufactured by Canadian Gypsum Company Inc.
2.1.5.5. At areas of high humidity, use zinc coated runners, furring channels and accessories.

2.1.6. **Partition System**

2.1.6.1. **Steel Studs:** 0.85 mm (20 gauge) thick steel, wiped coated, having knurled flanges 32 mm wide with edges doubled back at least 4.8 mm, with girts as required, and with service access holes.
2.1.6.2. **Partition Runners:** As specified for studs, with flanges a minimum of 22 mm high at floor, and 51 mm high for double runners at top of partitions and to suit width of studs.
2.1.6.3. **Control Joints:** No. 093 as manufactured by Canadian Gypsum Company Inc.

2.1.7. **Ceiling Hanger System**

2.1.7.1. **Hanger Anchoring Devices:**
Phillips Red Head by Phillips Drill Company of Canada Limited, Thornhill, Ontario
: T32 self drilling for use in concrete deck.
: WS-3822 wedge anchor with tie wire insert for use in composite concrete .

2.1.7.2. **Hangers:**
Zinc coated annealed steel wire:
: 2.8 mm dia. to support a maximum weight of 68 kg per hanger.
: 3.8 mm dia. to support a maximum weight of 140 kg per hanger.
Zinc coated annealed steel rod.
: 4.8 mm dia. to support a maximum weight of 250 kg per hanger.

2.1.8. **Sealant**

2.1.8.1. **Acoustical Sealant:** As manufactured by Tremco Manufacturing Co. (Canada) Ltd. or Presstite Acoustical sealant No. 579.64 as manufactured by Inmont Presstite Ltd.

2.1.8.2. **Fire Separation Sealant:** Sealant Type 1 as specified in Caulking Schedule of Section 07920 where exposed to view, and acoustical caulking at concealed locations.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Before application of board systems commences, ensure that services have been installed, tested, and approved; that conduits, pipes, cables, and outlets are plugged, capped, or covered; and that fastenings and supports installed by other Sections are in place.

3.1.2. Ensure that environmental conditions and construction completed before installation of gypsum board systems commences are satisfactory and will permit compliance with quality and dimensions required for gypsum board installation specified in this Section. Do not permit installations of others to touch the back of gypsum board.

3.1.3. Verify that installations performed by other Sections which are a part of an underwriter specification for a fire rated assembly have been done in accordance with that specification.

3.1.4. Verify that channels installed for rigid insulation are located properly and are well secured.

3.2. Installation

3.2.1. **General**

3.2.1.1. Coordinate installation of systems specified in this Section with installations of other Sections for
: attachment of hangers, fasteners, stiffeners, and reinforcing.
: support and incorporation of flush-mounted and recessed components. Ensure adequacy of supports by consultation and verification of methods specified in Divisions 15 and 16.

3.2.1.2. Install systems in accordance with approved manufactured' specifications and printed directions, as applicable for materials incorporated.

3.2.1.3. Do not install metal framing, trim, casings, or accessories which have been bent, dented, or otherwise deformed.

3.2.1.4. Securely attach trim, casings, framing, and accessories.

3.2.1.5. Framing and furring shown on Drawings is indicative but do not regard it as exact or complete. Construct systems to provide adequate strength to withstand stresses imposed by use without distortion, and to maintain dimensions indicated on Drawings.

3.2.1.6. Provide continuous backing for all edges of board.

3.2.1.7. Erect supporting and finish materials to dimensions indicated on Drawings; plumb, level, straight, and square to adjoining elements.

3.2.1.8. Provide for movement at intersections with structural members to avoid transference of loads to systems.

3.2.1.9. Make allowances for thermal movements in systems.

3.2.1.10. Do not support systems from, nor make attachment to, ducts, pipes, conduit, or the support framing installed by other Sections.

3.2.1.11. Install materials with the minimum of joints.

3.2.1.12. Splice, framing members only where continuous lengths are not available from manufacturer.

3.2.1.13. Frame openings on every side with suitable sections. Provide clearances required at mechanical and electrical services, such as grilles, diffusers, access panels, and lighting fixtures only after verification of requirements in each case.

3.2.1.14. Cooperate with other Sections. Where the installations of other Sections penetrate board construction, fit openings snugly, and to ensure cover by escutcheons and plates utilized.

3.2.1.15. Attach to framing, adequate steel reinforcing members to support the load of, and to withstand the withdrawal and shear forces imposed by, items installed by other Sections upon systems. Such items are, but not restricted to, coat hooks, washroom accessories, handrail anchors, guards, wall-hung cabinets and fitments, shelving, curtain and drapery tracks, and minor mechanical and electrical equipment and fixtures. Heavy mechanical and electrical equipment shall be self-supporting as specified in Divisions 15 and 16.

3.2.1.16. Provide fire stopping; bulkheads over doors, frames, screens, and changes in ceiling levels; stair soffits; furred beams; pipe spaces; all as indicated on Drawings.

3.2.2. **Suspended Ceiling Framing and Furring**

3.2.2.1. Anchor hangers to structural frame or to hanger anchoring devices installed by this Section. Ensure that anchorage is capable of carrying the imposed loads of the assembly design.

3.2.2.2. Space hangers for runner channels to suit structure, to support ceiling load, at a maximum distance of 1200 mm o.c., and at no greater distance than 150 mm from ends of runner channels.

3.2.2.3. Install runner channels at 900 mm o.c., generally, and at no greater distance than 150 mm from terminations of supported cross furring members. Bend rod hangers sharply under bottom flange of runners, and wire securely in place with saddle ties.

3.2.2.4. Splice runner channels by lapping at least 300 mm, with interlocking flanges, and wired at each end with two loops. Do not bunch or line up splices.

3.2.2.5. Install cross furring at 400 mm o.c, generally, and at no greater distance than 150 mm from walls, openings, breaks in continuity of ceiling, and changes of direction. Space furring in all cases to suit incorporated services, and so as to avoid contact with perimeter walls. Span hat-type furring no greater 1200 mm. Use metal studs for greater spans: 42 mm deep spanning to 1525 mm, 63 mm deep to 1800 mm, and 92 mm deep to 2400 mm.

3.2.2.6. Secure cross furring to supports with double wire ties or approved equivalent attachment. Splice by nesting and tying together with 200 mm overlap.

3.2.2.7. Erect entire hanger and suspension system to adequately support the ceiling assembly, including services incorporated, with a maximum specified deflection for each component member, and free from horizontal movement.

3.2.2.8. Enclose ducts, pipes, beams or other components that occur outside the general finished lines of ceilings, soffits and bulkheads with metal furring and gypsum board, in rooms where acoustic treatment for ceilings is specified.

3.2.3. **Metal Stud Framing**

3.2.3.1. Secure runner channels at floor and tops of partitions for their full length, at 600 mm o.c with concrete nails, square cut nails, toggle bolts, or sheet metal screws as suitable for base material. Install runner channels also at heads and sills of openings. Secure runners at openings by butting flanges, turning up webs, and screwing to studs.

3.2.3.2. Provide partition runners with deep flanges at heads of partitions where deflection and/or creep of structure will occur.

3.2.3.3. Butt, not mitre, runners at wall intersections and corners. Lap runners and screw channels together.

3.2.3.4. Space studs at 400 mm o.c., generally, or as indicated on Drawings, and at no greater distance than 50 mm from abutting walls, partitions, and corners.

3.2.3.5. Secure studs to runners by screws, crimping, or welding, as required by stud type, and in accordance with manufacturer's design specification. Include provisions for deflection of building structure to ensure that structural loads are not transferred to studs.

3.2.3.6. Install studs of depth indicated on Drawings: but in no case span studs 42 mm deep more than 2700 mm between supports; 63 mm deep, 3600 mm; and 92 mm deep, 4.5 m.

3.2.3.7. Double studs at door jambs. At each jamb or doors exceeding either 900 mm in width or 57 mm in thickness, or both, install a 100 mm hot rolled structural channel, to structure above, and adequately anchored at each end.

3.2.3.8. Double studs at all control joints.

3.2.3.9. Erect three studs at corner and intermediate intersections of partitions.

3.2.3.10. Install partition runners at heads and sills of openings in partitions. Form 150 mm bends in runners and secure bent portion to studs.

3.2.3.11. Splice studs by nesting, with an 200 mm minimum lap, and fastened with one screw in each flange.

3.2.3.12. Ensure that electrical boxes are not installed back to back in same stud space.

3.2.3.13. Install blocking for bases, frames and supports before board in applied.

3.2.3.14. Coordinate installation of board systems with other Sections installing horizontal runs of service lines so that all installations are done simultaneously. Where standard holes are too small for installed services, notch studs, and splice notched flanges with splice pieces 300 mm longer than notches, each fastened with two screws.

3.2.3.15. Screw, or weld, frame anchor clips, of frames, supplied by Section 08110, to jamb studs, and head and sill runners. Ensure adequate fastenings to prevent movement of the frame within the partition. Remove spreaders at floor after frames are anchored.

3.2.3.16. Unless shown otherwise on Drawings, partitions, together with gypsum board facings, shall extend above ceilings to underside of structure above.

3.2.4. **Accessories**

3.2.4.1. At External Corners: Install corner beads secured to framing at 150 mm o.c. on alternate flanges.

3.2.4.2. At Board Edges: Secure "J" shaped casing beads at 150 mm o.c. at edges exposed to view, where board butts against other materials with no trim to conceal junction, at control joints, at perimeter of ceiling surfaces, at tops of partitions where they stop against continuous ceiling surfaces, and where otherwise indicated on Drawings.

3.2.4.3. Install control joints in interior gypsum board systems at no greater spacing than 7.3 m for walls and 9 m for ceilings in each direction, at perimeters of ceilings where they abut walls and other vertical surfaces, or as otherwise indicated. Line up control joints with joints in other construction or with centre lines of mullions, columns, piers, or similar building elements.

3.2.4.4. Install casings and thermal breaks at junctions of gypsum board with exterior door, window, or screen frames.

3.2.5. **Application of Gypsum Board to Framing**

3.2.5.1. Extend board into door, window, and other opening reveals; behind mirrors, fitments, and other applied items of a fixed nature; and on metal stud partitions to structure above, unless noted otherwise on Drawings.

3.2.5.2. Apply board with long dimension perpendicular to supports except at stud partitions where they shall parallel studs.

3.2.5.3. Back all joints with a framing member. Locate joints on opposite sides of partitions on different studs, and at least 300 mm from opening jambs.

3.2.5.4. Install board in maximum lengths and widths to minimize joints, and in lengths of 1800 mm minimum, and stagger end joints where they are unavoidable. Locate joints in ceilings where least prominently discerned, and never line them up with opening edges.

3.2.5.5. Tightly butt board joints, without force, and align them neatly.

3.2.5.6. Form neat joints at mill ends and at edges of board panels cut in field. Cut paper on face with a knife. Smooth by sanding and rubbing edges together.

3.2.5.7. Do not install board in close proximity to hot pipes or heating ducts.

3.2.5.8. Fasten board to metal support members by metal drywall screws.

3.2.5.9. Locate fasteners at 10 mm minimum to, and 13 mm maximum from, centre of joints. Space fasteners at walls and ceilings at 300 mm o.c. at edges and in field, unless otherwise specified. At ceilings of fire rated board, space fasteners at 200 mm o.c. at edges and in field, unless otherwise specified. At walls of fire rated board space fasteners at 200 mm o.c. at edges and 300 mm o.c. in field. Locate fasteners opposite one another in adjacent panels.

3.2.5.10. Start application on walls at corners of rooms, and on ceilings from centre line of spaces. Do not force adjacent boards into place; allow moderate contact. Install extension clips where required. Drive screws to form a slight depression, but not so paper cover is broken.

3.2.5.11. Install board with casing bead at termination of gypsum board edge abutting adjoining surfaces to provide for differential movement at internal corners

3.2.6. **Finishing of Joints and Depressions at Gypsum Board**

3.2.6.1. Fill joints, casing beads, corner beads, holes at board fasteners and depressions on board surfaces exposed to view to ensure smooth seamless surfaces and square neat corners. Use jointing compounds and reinforcing tapes in conformance with manufacturer's specifications. Ensure that board is tight against framing members, fasteners are properly depressed, and adhesives have sufficiently cured.

3.2.6.2. Fill joints by three-coat method.
: Embed reinforcing tape in a cover coat of joint filler.
: Apply level coat of joint filler when cover coat has dried.
: Feather edges of compounds into surfaces of boards. After skim coat has dried for at least 24 hours, sand to leave smooth for decoration. Do not sand paper face of board.

3.2.6.3. At bevelled joints, apply cover coat 180 mm wide, level coat 250 mm wide, and skim coat 300 mm wide.

3.2.6.4. At end joints and butt joints formed at cut edges of board, apply cover coat 355 mm wide, level coat 500 mm wide, and skim coat 600 mm wide. Camber treatment over end joints to 0.8 mm thick at most.

3.2.6.5. At Internal Corners: First fill gaps between boards with joint filler. Embed creased reinforcing tape in a thin coat of joint filler applied 50 mm wide at each side of corner. Apply cover coat as specified for bevelled joints. Apply skim coat (as specified for bevelled joints) to just one side of joint, and when dry, apply skim coat to other side.

3.2.6.6. At External Corners: Fill to nose of corner bead with joint filler and topping cement as specified for bevelled joints.

3.2.6.7. At Casing Beads: As specified for bevelled joints.

3.2.6.8. At Board Fasteners: Fill holes and depressions with 2 coat application of joint filler.

3.2.7. **Caulking**

3.2.7.1. Caulk between casing beads and other construction where junction exposed to view.

3.2.7.2. Caulk junctions between gypsum board fire separations and protection, and other construction to ensure that integrity of fire rating is maintained. Ensure that caulked joints provide a continuous seal and that they are caulked before other installations enclose them.

3.2.7.3. Clean joints, and prime and install sealants in accordance with the requirements of Joint Sealants, Section 07920.

3.3. Adjustment and Cleaning

3.3.1. Remove droppings and excess of joint compound from property, materials and surfaces of others, and from board and accessories installed by this Section, before it sets.

3.3.2. Make good to cut-outs for services and other installations, fill in defective joints, holes and other depressions with joint compound.

3.3.3. Make good defective board installations, and ensure that surfaces are smooth, evenly textured and within specified tolerances to receive finish treatments.

3.3.4. Clean off beads, casings and other metal trim, and leave all surfaces ready for specified finishes.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections related to this Section is specified in:

Section 04200 – Unit Masonry
Section 09250 - Gypsum Drywall

1.2. Material Supply

1.2.1. All tile will be supplied by owner from surplus stock.

1.3. Quality Assurance

1.3.1. Subcontractor Qualifications

1.3.1.1. Perform tile installation specified in this Section only by a Subcontractor who has adequate plant, equipment, and skilled tradesmen to perform it expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past five years.

1.4. References

1.4.1. Reference Standards

1.4.1.1. Reference standards quoted in Contract Documents refer to:
1.4.1.2. ANSI A108.1-1976, American National Standard Specifications for Installation of Ceramic Tile.
1.4.1.3. ANSI A118.1-1976, American National Standards Specifications for Dry-Set Portland Cement Mortar. ANSI A118.3-1976, American National Standard Specifications for Chemical Resistant Water-Cleanable Tile-Setting and Grouting Epoxy.
1.4.1.4. ASTM C206-79, Specification for Finishing Hydrated Lime.
1.4.1.5. ASTM C207-79, Specification for Hydrated Lime for Masonry Purposes. CAN/CGSB-75.1-M77, Tile, Ceramic.
1.4.1.6. CAN/CSA-A5-M83, Portland Cements.

1.5. Submittals

1.5.1. Samples

1.5.1.1. Submit 300mm x 300mm panels, or at least 4 units, of tile selected at random from stock.

1.5.2. **Maintenance Instructions**

1.5.2.1. Submit maintenance instructions for incorporation in Project Data Book.

1.6. Site Conditions

1.6.1. **Environmental Requirements**

1.6.1.1. Install tile only when base surfaces and air temperatures have been maintained between 10°C and 21°C for 72 hours preceding installation and until setting materials have cured.

1.7. Warranty

1.7.1. **Extended Warranty**

1.7.1.1. Submit a warranty of tile products and installation specified in this Section covering the period for one year beyond the expiration of the warranty period specified in the General Conditions to the Contract.

PART 2 – PRODUCTS

2.1. Materials

2.1.1. **Setting**

2.1.1.1. Floor Tile – TEC 382 mortar.
2.1.1.2. Portland Cement: To meet specified requirements of CAN/CSA-A5-M83.
2.1.1.3. Hydrated Lime: To meet specified requirements of ASTM Specification C206 or C207 for Type S.
2.1.1.4. Sand: To meet specified requirements of CSA Specification A82.56, passing 1.6mm sieve. Use white sand for white grout.
2.1.1.5. Water Potable, containing no contaminants which cause efflorescence.
2.1.1.6. Additives: for mortar: to meet specified requirements of ANSI Standard A118.4 and CGSB Specification 71-GP-30M, Type 2; acrylic latex; Keraply by Mapei.
2.1.1.7. for grout: to meet specified requirements of ANDI Standard A118.6, Kerapoxy by Mapei.
2.1.1.8. Colour Pigment: Non-fading mineral oxides or carbon black emulsion, unaffected by lime or cement, and which will not stain tile.
2.1.1.9. Primer: To meet requirements of supplier of bond coat.
2.1.1.10. Dry Curing Grout: Premixed, dry set, as recommended by tile supplier.

2.1.2. **Porcelain Floor Tile**

2.1.2.1. PCT1- Field Tile: Max Basaltina 24 x 24 Mocha Mat – MAXBST6308 BY Centura
2.1.2.2. PCT2- Highlight Tile: Max Basaltina 24 x 24 Nero Mat – MAXBST6305 BY Centura
2.1.2.3. Grout Colour: 927 Light Pewter

2.1.3. **Ceramic Wall Tile**

2.1.3.1. PCT 3 – Field: Piemme 12 x 24 Purestone Grigio Natural - KPUS03 by Centura
2.1.3.2. PCT 4 – Accent Tile: Max Basaltina 1 x 2 Mocha Mosiac (Matte) – MAXBST300MO12 By Centura.
2.1.3.3. Grout Colour: 903 Birch

2.1.4. **Grout**

2.1.4.1. Accucolour XT Floor Grout.

2.1.5. **Cleaner**

2.1.5.1. To meet specified requirements of #1000 Series of Terrazzo, Tile and Marble Association of Canada.

2.1.6. **Galvanizing**

2.1.6.1. To meet specified requirements of ASTM Specifications A525, AF275 Coating Designation for sheet steel: A153 Class B.3 Coating, for hardware, Class 3 Coating, for wire and rods.

2.1.7. **Flooring Accessories**

2.1.7.1. Schluter finishing strip. Finish to be brushed aluminum.
2.1.7.1.1. Porcelain Tile to VCT: Schluter Systems RENO-RAMP. Provide accessible slope.
2.1.7.1.2. Porcelain Tile to Porcelain Tile: Schluter Systems SCHIENE.

PART 3 – EXECUTION

3.1. Examination

3.1.1. Ensure that environmental conditions and backing surfaces have been provided according to specified requirements.

3.1.2. Defective tile installation resulting from application to unsatisfactory surfaces will be considered the responsibility of this Section.

3.2. Preparation

3.2.1. **Protection**

3.2.1.1. Prevent traffic and construction by other Sections on newly laid tile by barricading areas for at least 48 hours following installation.

3.3. Installation

3.3.1. General

3.3.1.1. Install tile in accordance with details and specifications of Terrazzo, Tile and Marble Association of Canada Installation Manual 200-1979, Ceramic Tile, as applicable, and otherwise in accordance with ANSI Specification A108.1

3.3.1.2. Lay out tile according to architectural drawings such that fields are centered on areas, with no tiles of less than half size included. Maintain heights of panels in full courses to nearest indicated dimension.

3.3.1.3. Lay tile on vertical surfaces with joints plumb and level.

3.3.1.4. Lay tile on floors with joints parallel to walls, at right angles to each other except where pattern is indicated on drawings.

3.3.1.5. Lay tile so that wall and floor joints are in line.

3.3.2. Setting

3.3.2.1. Place as much tile as possible in one operation before setting bed reaches initial set.

3.3.2.2. Clean back and remove bed when it has set before tile is laid.

3.3.2.3. Prime entire backing surface for bond coats.

3.3.2.4. Immediately prior to applying mortar bed over concrete or concrete block, evenly saturate substrate with clean water.

3.3.2.5. Line up joints between tile installed on stairs from tread to tread.

3.3.3. Tile

3.3.3.1. Leave or cut openings to correct sizes to receive accessories, fittings, or other items built into tile.

3.3.3.2. Cut and grind tile accurately, and without damage, to fit openings, at intersections and against trim finish. Rub exposed cut edges smooth with abrasive stone.

3.3.3.3. Drill tile for hardware and for pipes where possible. Otherwise at pipes and fittings, fit tile closely so that escutcheons cover cuts.

3.3.3.4. Extend tile into recesses at windows, doors, or other openings.

3.3.3.5. Extend wall tile behind fitments, mirrors and other applied items of a fixed nature, by a sufficient amount to ensure overlap.

3.3.3.6. Joint Width: 1.6mm wide between ceramic tile units.

3.3.3.7. Provide joints coloured to match tile.

3.3.4. Grouting

3.3.4.1. Remove spacers, strings, ropes or pegs before grouting.

3.3.4.2. Grout tile joints in accordance with grout manufacturer's directions and to fill joints solidly.

3.3.4.3. Fill all gaps and skips, cover setting bed completely. Ensure finish grout is uniform in colour, smooth and without voids, pinholes or low spots.

3.3.4.4. Damp cure grout for at least 72 hours.

3.3.5. **Adjustment**

3.3.5.1. Before Project completion, remove and replace defective, damaged, loose, and unbonded tile; and point defective joints.
3.3.5.2. Wash tile surfaces with water.
3.3.5.3. Wash unglazed surfaces with #1000 Series cleaner. Use 5% solution of muriatic acid only when preceded and followed by a complete drenching of clean water, and only when other cleaning methods are insufficient.

3.4. Cleaning

3.4.1. **Cleaning on Completion of Installation**

3.4.1.1. Remove deposits which affect appearance.
3.4.1.2. Remove protective materials.
3.4.1.3. Clean surfaces by washing with clear water; or with water and soap or detergent; followed by a clear water rinse.
3.4.1.4. Clean and restore stained metal surfaces in accordance with manufacturer's recommendations. Replace if cleaning is impossible.
3.4.1.5. Final cleaning is specified in Section 01711.

3.5. Extra Stock

3.5.1. At the completion of the work, provide ten (10) new, clean packaged ceramic floor tiles of each colour to be turned over to the owner.

3.5.2. At the completion of the work, provide an equivalent to 3 sq. m. of wall coverage, clean packaged ceramic wall tiles of each colour to be turned over to the owner.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections Related to This Section is Specified in:

Section 09250: Gypsum Drywall, Bulkheads, Ceilings
Drawings: Mechanical Services
Drawings: Electrical Fixtures

1.2. System Description

1.2.1. Tolerances

1.2.1.1. Install ceilings within 3.2 mm of dimensioned height above floor unless approved otherwise. Level within maximum tolerance of 3mm in 3 m.
1.2.1.2. Install framing members to ensure that deflection of each member does not exceed 1/360 of its span under dead load and loads imposed by mechanical and electrical equipment and fixtures supported by ceiling.

1.3. Quality Assurance

1.3.1. Subcontractor Qualifications

1.3.1.1. Install acoustical ceilings specified in this Section only by Subcontractor who has adequate equipment and skilled mechanics to perform it expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least five years.

1.4. References

1.4.1. Reference Standards

Reference standards quoted in Contract Documents refer to:
CAN/CSA-A82.27-M91, Gypsum Board Products

1.5. Submittals

1.5.1. Samples

1.5.1.1. Submit two samples of each specified acoustical board and exposed grid material.

1.6. Delivery, Storage, and Handling

1.6.1. Package finish materials.

1.6.2. Store materials in protected dry area.

1.6.3. Ensure that finish metal members are not bent, dented, or otherwise deformed.

1.7. Site Conditions

1.7.1. Install acoustical ceilings in areas closed and protected against weather, maintained at no less than 10°C.

1.7.2. Do not install acoustical ceilings in any area unless satisfied that construction in place has dried out, and that no further installation of damp materials is contemplated.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Accessories

2.1.1.1. Fabricate miscellaneous clips, splicers, connectors, screws, other standard accessories of steel, zinc coated or cadmium plated, of strength and de-sign compatible with suspension methods and system specified. Include special accessories to provide complete assembly of acoustical ceilings.

2.1.2. Hangers

2.1.2.1. Galvanized annealed steel wire; 2.8 mm dia. to support a maximum weight of 68 kg per hanger, #9 ga. to support a maximum weight of 140 kg per hanger. Galvanized annealed steel rod; 4.8 mm dia. to support maximum weight of 250 kg/hanger.

2.1.3. Hanger Anchoring Devices

Phillips Red Head by Phillips Drill Company of Canada Limited, Thornhill, Ontario
: T32, self drilling for use in concrete deck.
: WS-3822 wedge anchor with tie wire insert for
use in composite concrete and steel deck.
: SDI-3822 for use in steel floor deck, with screw
screw eye bolts to suit inserts.

2.1.4. Exposed Tee Ceiling Grid System

2.1.4.1. Two directional, 610 mm X 1220 mm.
2.1.4.2. Main Beams: 0.508 mm steel, bulb tees.
2.1.4.3. Cross Tees: 0.508 mm steel, with tongues to interlock with main beams.
2.1.4.4. Wall Moulding: Angle section to match tees.
2.1.4.5. Finish: Baked vinyl enamel, white.

2.1.5. Acoustical Units

2.1.5.1. Acoustical units shall match submitted samples with no perceptible visual variations within a building area. Fabricate edges uniformly and true to fit suspension system, and maintain true lines and surface planes.

2.1.5.2. **Acoustic Units**
Type 1
Pattern: Non-directional Fissured – Cortega 823
Colour: White
Edge: Regular, lay-in (square)
Size: 610 mm X 1220 mm (Imperial)
Thickness: 15 mm
Noncombustible
Manufacturer: Armstrong

PART 3 - EXECUTION

3.1. Examination

3.1.1. Ensure that environmental conditions and installations preceding that of this Section are satisfactory, and will permit compliance with the quality and dimensions required of acoustical ceilings.

3.2. Installation

3.2.1. Coordinate installation of acoustical ceiling systems specified in this Section with that of other Sections. Ensure that adequate preparation is made for attachment of hangers and fasteners. Install framing for support and incorporation of flush-mounted and recessed service components. Ensure adequacy of supports by consultation and verification of methods and locations of installations specified in Divisions 15 and 16.

3.2.2. Install hangers before sprayed fireproofing.

3.2.3. Install hanger anchoring devices in appropriately drilled holes.

3.2.4. Screw apply hanger anchoring devices to metal floor deck.

3.2.5. Do not use through the roof hangers.

3.2.6. Do anchor hangers from or make attachment to, ducts, pipes, conduit, or the support framing installed by other Sections.

3.2.7. Space hangers for supporting grid at 1220 mm max. centers each way, and to suit structure and ceiling system. Secure hangers to structure by a permanent method as approved. Secure wire hangers to framing by bending sharply upward and wrapping securely with 3 turns. Install hangers free of kinks and at no more than 5° off vertical. Install extra hangers at each corner of lighting fixtures. Reinforce other ceiling equipment with hangers.

3.2.8. Install the entire hanger and suspension grid to adequately support the ceiling assembly, including services incorporated, with a maximum specified deflection for each component member, and free from horizontal movement.

3.2.9. Lay out ceilings with acoustic units evenly spaces in each area, with grid lines symmetrical about room axes, columns and service element, and with maximum border widths of equal dimensions on opposite sides of areas, or as indicated on reflected ceiling plans. Provide angle moldings to match exposed grid where ceilings abut walls or other vertical surfaces. At curved or circular element, cut vertical legs and bend track to conform to element.

3.2.10. Frame around recessed fixtures, diffusers, grilles, and openings.

3.2.11. Maintain true surface planes, and component and joint lines throughout each area.

3.2.12. Butt joints between components tightly together.

3.2.13. Install grid system ceilings as specified by the manufacturer of the system. Ensure that methods of installation used are acceptable to the manufacturer of each system component and Architect.

3.2.14. Brace system to maintain alignment of grid.

3.2.15. Install acoustical panels in exposed tee system. Cut panels neatly to fit off-module grid, with sufficient clearances to ensure removal without damage.

3.2.16. Do not install acoustical units with broken or marred edges exposed to view.

3.2.17. Install hold-down clips at each panel. Adapt installation to provide ceiling access where required for services.

3.2.18. Mark access panels in an unobtrusive manner.

3.2.19. Where retention clips are specified for Type 3 ceilings, install clips in accordance with manufacturers' written instructions.

3.3. Adjustment and Cleaning

3.3.1. Clean soiled/discoloured surfaces of exposed ceiling surfaces on ceiling installation completion.

3.3.2. Replace components which are visibly damaged, marred, or uncleanable.

3.4. Extra Stock

3.4.1. Provide 2 sealed cartons of each specified acoustical board for Owner's use. Deliver to site at conclusion of project.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work Performed by Other Sections related to this Section is specified in:

Section 03300 - Cast-In-Place Concrete
Section 04200 - Unit Masonry
Section 09250 - Gypsum Drywall

1.2. Quality Assurance

1.2.1. Subcontractor Qualifications

1.2.1.1. Apply coatings specified in this Section only by a Subcontractor as applicable who has adequate equipment and skilled tradesmen to perform it expeditiously, is an applicator approved by supplier of wall coating applied, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past two years.

1.2.2. Requirements of Regulatory Agencies

1.2.2.1. Coatings shall meet fire hazard classification requirements of jurisdictional authorities for each material in each installation location as applicable.
1.2.2.2. Apply coatings that require fire hazard classification exactly as specified in Underwriter's Laboratory test specification that validates specified rating.
1.2.2.3. Fire hazard classification shall not exceed
: for Flame Spread: 25 for exits and 150 elsewhere.
: for Smoke Developed: 50 for exits and 300 elsewhere.

1.2.3. Mock-Up

1.2.3.1. Apply a sample of each finished coating system to each substrate material to provide mock-up as specified in Section 01400. Remove samples disapproved because of failure to meet specified appearance and provide a new sample area.
1.2.3.2. Each sample application shall cover an area of 9sq.m or the entire surface of the designated wall, whichever is the lesser.

1.3. References

1.3.1. Reference Standards

1.3.1.1. Reference standards quoted in Contract Documents refer to:
CGSB Specification 1-GP-186, Coating System, Interior, High Build, Glazed.

1.4. Submittals

1.4.1. Samples

1.4.1.1. Submit 216 mm x 280 mm samples of each specified coating, in each colour and texture to match existing colour schemes in areas of renovation.

1.4.2. Maintenance Instructions

1.4.2.1. Submit maintenance instructions for incorporation in Project Data Book.

1.5. Delivery, Storage and Handling

1.5.1. Package, seal, and label each coating material to show manufacturer's and product name, fire hazard classification, and colour.

1.5.2. Store materials at site in an area specifically set aside for purpose that is locked, ventilated, and maintained at a minimum temperature of 10 deg.C.

1.5.3. Ensure that health and fire regulations are complied with in storage area, and during handling and application.

1.6. Site Conditions

1.6.1. Environmental Requirements

1.6.1.1. Do no apply coatings over substrates that contain over 14% moisture.
1.6.1.2. Apply coating only
: with surface temperatures at a minimum of 0 deg.C for 24 hours before during application, and for 24 hours following application or until cured.
: when no dust is being raised.
: in well-ventilated and broom clean areas.

1.7. Warranty

1.7.1. Extended Warranty

1.7.1.1. Submit a warranty for the work of this Section covering the period for (4) four years beyond the expiration of the warranty period specified in the General Conditions to the Contract.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Each material used in the application of each coating system shall be as recommended or manufactured by the supplier of the coating.

2.1.2. High Build Type Inorganic Non-Cementitious Coating:
To meet specified requirements of CGSB Specification 1-GP-186.
Ev-Rok by Canadian Everguard Division of Sternson Limited or equivalent coatings by:
MacNaughton-Brooks Products Limited, Duron Canada Limited or Everspec Surfaces Limited.

2.1.3. Colours and textures will be selected to match proposed colours and textures in finish schedule.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Verify that specified environmental conditions are ensured before commencing application of coating.

3.1.2. Test surfaces for moisture content and acid-alkali balance to ensure that they are suitable for application.

3.1.3. Ensure that surfaces to receive coatings have been provided by other Sections as specified; that they will not adversely affect execution, permanence, or quality of coatings; and that they can be put into acceptable condition by means of preparation specified in this Section. Surfaces to be finished are shown on Drawings or in Finish Schedule.

3.1.4. Defective coatings resulting from application to unsatisfactory surfaces will be considered the responsibility of this Section.

3.2. Preparation

3.2.1. Following his acceptance of surfaces, coating applicator shall be responsible for surface preparation not specified as the responsibility of other Sections.

3.2.2. Clean, prime and seal surfaces as recommended by coating manufacturer.

3.2.3. Cover or mask surfaces adjacent to those receiving coating to protect materials and surfaces installed by other Sections, and property from damage and soil.

3.2.4. Materials soiled by coatings during application and storage, and from which soil cannot be completely removed, shall be replaced by this Section.

3.3. Application

3.3.1. General

3.3.1.1. Apply special coating in accordance with coating manufacturer's specifications and by an applicator approved by the manufacturer to the surfaces indicated on Drawings or in Finish Schedule.
3.3.1.2. Coating manufacturer shall supervise application.
3.3.1.3. Before coating application commences, arrange for a site meeting, in accordance with Section 01200, at which conditions of surfaces as built and possible adaptations required to suit, and use of materials and application procedures, shall be discussed between Contractor, Special Coatings Subcontractor, Architect, and representatives of materials manufacturer.
3.3.1.4. Place cloths and other disposable finishing materials, that are a fire hazard, in closed metal containers, and remove from building every night.
3.3.1.5. Post "No Smoking" signs and ensure that spark-proof electrical equipment is used in areas where inflammable materials are being applied.
3.3.1.6. Post "Wet Coating" signs throughout freshly finished areas and remove when finishes are cured.

3.3.1.7. Erect barriers to prevent the entry and presence of personnel not performing special coatings application during application of coatings, and for 24 hours following completion of application.
3.3.1.8. Apply coatings with no runs, laps, voids, or other marks or irregularities, and with uniform colour, sheen and texture.
3.3.1.9. Make clean true junctions with no visible overlap between adjoining applications of coatings.
3.3.1.10. Match colours and textures of approved samples.
3.3.1.11. Apply each successive coat only after the previous coat has dried.

3.3.2. **Filler**

3.3.2.1. Apply to concrete unit masonry. Apply in minimum thickness to provide a smooth and level substrate for finish coating.

3.3.3. **Primer**

3.3.3.1. Apply as recommended by coating manufacturer for substrate and finish coating. Apply in minimum thickness of 7 mil.

3.3.4. **Finish Coating**

3.3.4.1. Apply as recommended by manufacturer. Apply in minimum thickness of 7 mil.

3.3.5. **Glaze Coating**

3.3.5.1. Apply as recommended by manufacturer. Apply in minimum thickness of 7 mil.

3.3.6. Apply coatings to a total thickness of 21 mil.

3.4. Field Quality Control

3.4.1. Verify by Tooke thickness gauge, and in the presence of the Architect, that thicknesses of completed coatings meet specified requirements.

3.5. Adjustment and Cleaning

3.5.1. Touch up and refinish minor defective coatings. Refinish entire coated surface where finish is damaged or otherwise unacceptable.

3.5.2. Remove promptly as coating application progresses, spilled or spattered coating materials from surfaces of products and property of other Sections. Do not mar surfaces while removing.

3.5.3. Leave storage and mixing areas clean and in same condition as equivalent spaces in Project.

3.5.4. Final cleaning is specified in Section 01710.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Scope of Work

1.1.2.1. This Section of Work shall include all labour, materials, tools, scaffolds and other equipment, services and supervision required to cover with paint the surfaces of the building, or structure, building services and accessories not otherwise protected or covered, as shown on the "Room Finish Schedule" to the full intent of the Drawings and Specifications but does not include Mechanical Rooms.

1.1.2.2. Refer to Drawings and Finish Schedules for type, location and extent of finishes required, and include all field painting necessary to complete work shown, scheduled or specified, including backpriming and surface preparation as specified herein.

1.1.3. Related Work Specified Elsewhere

Section 06200: Finishing of Millwork

1.2. Quality Assurance

1.2.1. Subcontractor Qualifications

1.2.1.1. The paint products and Manufacturer shall be listed in the Ontario Painting Contractors Association Specification Manual, latest edition, under Paint Product Recommendation section, or approved equivalent. Ideal and CIL equivalent products are considered equivalents.

1.2.1.2. Perform painting and finishing specified in this Section only by a Subcontractor who has a minimum of five years of proven satisfactory applications similar to that specified. Subcontractor shall have equipment and skilled tradesmen to perform work expeditiously. Journeymen (and apprentices) shall have a provincial Tradesman Qualification certificate of proficiency.

1.2.2. Requirements of Regulatory Agencies

1.2.2.1. Apply coatings that require fire hazard classification exactly as specified in Underwriters' Laboratories test specification that validates specified rating.

1.2.2.2. Coatings shall meet fire hazard classification requirements of jurisdictional authorities for each material in each installation location as applicable.

1.2.2.3. Fire retardant coatings to meet fire hazard classification requirements of jurisdictional authorities for each installation location.

1.2.2.4. Fire hazard classification ratings shall not exceed for:

1.2.2.4.1. Flame Spread: 25 for exits, 150 otherwise

1.2.2.4.2. Smoke Developed: 50 for exits, 300 otherwise.

1.2.3. **Mock-Up**

1.2.3.1. Before proceeding with painting, finish one complete space or item of each colour scheme required, showing selected colours, finish texture, materials and workmanship. After approval, the sample rooms or items shall serve as a standard for similar work throughout the building.

1.2.4. **Inspection**

1.2.4.1. A painting inspector may be appointed by the Consultant in order to provide independent inspection of all painting and testing where required.

1.2.4.2. The inspector shall review the condition of the substrate prior to application of any paint. The inspector shall review all painting applications in accordance with a predetermined plan agreed upon by the painting contractor, the painting inspector and the Consultant.

1.2.4.3. The painting inspector shall be acceptable to the Architect and the OPCA Association. The cost for the inspection reports shall be paid from the Inspection and Testing Allowance.

1.3. Submittals

1.3.1. **Approvals**

1.3.1.1. Submit a written request to the Architect for approval of equivalent products during bidding period, listing each of the materials proposed, surfaces to be covered. State clearly manufacturer's name and brand name of any proposed equivalent material.

1.3.2. **Colour Schedule**

1.3.2.1. Paint and colours shall be selected by the Architect.

1.3.2.2. Before any painting is to commence, the architect shall furnish a colour schedule showing where the various colours and finishes shall be applied.

1.3.3. **List of Materials**

1.3.3.1. Before ordering materials, submit a list of those materials proposed for use for approval. For each material, give manufacturer and descriptive nomenclature that will appear on container labels. Do not order materials that have not been approved.

1.3.4. **Affidavits**

1.3.4.1. Submit affidavits from manufacturer to certify that materials supplied for project meet specification requirements and that the manufacturer approves of their use for each proposed application.

1.3.5. **Samples**

1.3.5.1. Painter to prepare samples of each type of paint, stain and application specified, on 220 X 280 mm plywood for approval, to be left on the job site until painting contract is complete. Label samples to indicate finish, formula, colour name, number, sheen and gloss.

1.3.6. **Inspection Reports**

1.3.6.1. A painting inspector shall review and submit reports on the quality of the painting contract.

1.4. Guarantee

1.4.1. The painting contractor shall furnish a Canadian Painting Contractors two-year Guarantee, or alternatively a 100% two-year Maintenance Bond, on completion of the work. The Guarantee (or Maintenance Bond) shall warrant that the work has been performed in accordance with the standards and requirements incorporated in the Canadian Painting Contractors Architectural Specification Manual, latest edition. The work performed by the Painting Contractor shall be inspected by an independent inspector acceptable to the specifying authority and to the appropriated Provincial Painting and Decorating Contractors Association. The cost of this inspection and the Guarantee (or Maintenance Bond) shall be included in this tender.

1.4.2. Painting contractors using a Maintenance Bond type of guarantee shall supply with their tenders a facsimile of the bond to be used, together with written proof of their ability to furnish same, at no cost to the owner. In either event, the inspection is as referred to in the CPCA manual.

1.5. Delivery, Storage, and Handling

1.5.1. Deliver each container sealed and labelled with manufacturer's name, catalogue number/brand name, colour, formulation type, reducing instructions, and reference standard specification number if applicable.

1.5.2. Store only acceptable project materials at site, in area specifically set aside for purpose that is locked, ventilated, maintained at a temperature of over 7°C, and protected from direct rays of sun.

1.5.3. Ensure health and fire regulations are complied with in storage area. Provide carbon dioxide fire extinguishers of 9 kg minimum capacity in each storage area while materials are contained within.

1.5.4. On each container, for materials requiring a fire hazard classification, attach Underwriter's label verifying material is listed under their label service, and giving the hazard classification.

1.6. Site Conditions

1.6.1. **Environmental Requirements**

1.6.1.1. Apply painting materials only when air and surface temperatures exceed 5°C, except for:
1.6.1.1.1. 7°C for latex paint at interior locations
1.6.1.1.2. 10°C for latex paint at exterior locations
1.6.1.1.3. 21°C for lacquers and enamels

1.6.1.2. Do not apply exterior finishes in direct sunlight that raises surface temperatures above that for proper application and drying, nor in rainy, foggy, or windy weather.

1.6.1.3. Do not apply finishes when relative humidity is over 85%, when condensation has formed or is likely to form, nor immediately following rain, frost or formation of dew.
1.6.1.4. Test moisture of surfaces by electronic Moisture Meter.
1.6.1.5. Do not apply finishes when dust is raised.
1.6.1.6. Do not apply finishes on porous surfaces as concrete, plaster, gypsum board, pipe insulation, masonry, containing over 12% moisture.
1.6.1.7. Masonry and Concrete Blocks must by installed at least 28 days prior to painting and must by visually dry on both sides before painting commences. This is not to be construed as including a "wetting down" process for Latex.
1.6.1.8. Concrete Floors shall be tested for moisture by a simple "cover patch test".
1.6.1.9. Painting and decorating work shall not proceed unless a minimum of 15 foot candles of lighting is provided on the surfaces to be painted. Adequate lighting facilities shall be provided by the General Contractor.
1.6.1.10. All areas where painting and decorating work is proceeding require adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 7 deg. C. for 24 hours before and after paint application. Required heat and ventilation shall be provided for the Painting Subcontractor.

1.7. Protection

1.7.1. Protect other surfaces from paint and damage and make good any damage caused by failure to provide suitable protection, but will not be responsible for any damage caused by others.

1.7.2. Furnish sufficient drop cloths, shields and protective equipment to prevent spray or dropping from fouling surfaces not being painted and in particular, surfaces within the storage and preparation area.

1.7.3. Waste, cloths and material which ma constitute a fire hazard shall be placed in closed metal containers and removed daily from the site.

1.7.4. Remove all electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items shall be carefully stored, cleaned and replaced on completion of work in each area. No solvent shall be used to clean hardware that will remove the permanent lacquer finish on some of these items.

PART 2 - PRODUCTS

2.1. Materials

2.1.1. Paint, varnish, stain, enamel, lacquer, and fillers shall be of a type and brand specified and listed under "Paint Product Recommendations" as covered in the Association Manual, latest edition, for specified purposes.

2.1.2. Paint materials such as linseed oil, shellac, turpentine, etc., and any of the above materials not specifically mentioned herein be required for first class work with the finish specified shall be the highest quality product of an approved manufacturer. All coating material shall be compatible.

2.1.3. Only "top line" products produced by their manufacturers are acceptable.

2.2. Mixing

2.2.1. Paints to be supplied ready-mixed unless otherwise specified, except that any coating in paste or powder form, or to field-catalysed shall be field-mixed in accordance with the directions of its manufacturer. Pigments shall be fully ground and shall maintain a soft paste consistency in the vehicle during storage that can and shall be dispersed readily and uniformly by paddle to a complete homogeneous mixture.

2.2.2. Paint shall have good flowing and brushing properties and shall dry or cure free of sags, etc. to yield the desired finish specified.

PART 3 - EXECUTION

3.1. Examination

3.1.1. Prior to commencement of work of this section, thoroughly examine all surfaces scheduled to be painted.

3.1.2. Test all surfaces for moisture content with an electronic moisture meter. Test surfaces of materials containing lime for acid-alkali balance.

3.1.3. Maintain at site at all times until applications are completed a moisture meter, hygrometer and thermometer to verify surface and environmental conditions.

3.1.4. Report in writing to the Contractor and the Architect any condition adversely affecting this work. No painting work shall proceed until all such defects have been corrected and surfaces are acceptable to the Painting Inspector.

3.1.5. Defective painting and finishing applications resulting from failure to properly test surfaces and/or from application to unsatisfactory surfaces shall be considered the responsibility of this Section.

3.1.6. Continuation of painting after first coat on drywall, plaster, structural steel and miscellaneous metal surfaces, shall imply acceptance of surfaces.

3.2. Preparation

3.2.1. General

3.2.1.1. Vacuum clean interior areas immediately before finishing work commences.

3.2.1.2. Remove from all surfaces grease, oil, dirt, dust, ridges, and other oil and materials that would adversely affect the adhesion or appearance of finish coatings.

3.2.1.3. Remove rust from damaged surfaces primed by other Sections or previously painted and reprime.

3.2.1.4. Neutralize highly alkaline surfaces with a neutralizing wash of 4% solution of zinc sulphate. Substitute 4% solution of tetrapotassium pyrophosphate for surfaces to receive latex paints. Brush off residue before painting.

3.2.1.5. Scrub mildewed surfaces with solution of tri-sodium phosphate, and bleach with a solution of one part sodium hypochlorite (Javex) to three parts water. Rinse with clear water.

3.2.2. **Surface Preparation**

3.2.2.1. Surface preparation to receive painting and finishing included under this Section of work shall be as follows or as specified in the Canadian Painting Specifications Manual and the Room Finish Schedule.

3.2.2.1.1. **General:** Remove from all surfaces grease, oil, dirt, dust, ridges, and other oil and materials that would adversely affect the adhesion or appearance of finish coatings.

3.2.2.1.2. **Woodwork and Millwork:** Clean and remove all foreign matter prior to prime coat application and sealing of knots, pitch streaks and sappy sections with sealer. Puttying of nail holes and minimal cracks after prime coat has dried and sanding between prime coat and following coats except final coat. Backpriming to interior and exterior woodwork.

3.2.2.1.3. **Concrete Floors:** Shot blast and etch.

3.2.2.1.4. **Galvanized Steel and Iron:** Washing (Etching).

3.2.2.1.5. **Plaster:** Minimal cracks, holes and imperfections shall be filled with patching plaster and smoothed off to match adjoining surfaces by the Plastering Contractor after the prime coat has been applied. Washing and neutralizing high alkali surfaces where they occur. Moisture test surfaces before paint application.

3.2.2.1.6. **Masonry, Concrete, Stucco and Cement Render:** Surfaces which are very smooth or have traces of form oil or parting compounds shall be treated with acid-detergent treatment and washed with water. Powder, chalking, oxidizing to be removed.

3.2.2.1.7. **Drywall:** Surfaces shall be in a ready condition to paint. Any imperfection showing after application of the prime coat shall be corrected by the Drywall Contractor.

3.2.3. **New Material**

3.2.3.1. **Aluminum** (unfinished)

3.2.3.1.1. Remove surface contamination by steam, high pressure water or xylene solvent washing. Apply etching type primer (or acid etching) then paint immediately, as per Manufacturers: Direction.

3.2.3.2. **Asphalt, Creosote, Tar & Bituminous Surfaces**

3.2.3.2.1. Remove dirt, oil, grease, sand if necessary for adhesion key. Apply Latex based sealer or primer.

3.2.3.3. **Canvas & Cotton Insulated Coverings:**

3.2.3.3.1. Remove dirt, grease and oil, test for moisture content of 12% or less.

3.2.3.4. **Copper**

3.2.3.4.1. Painted:Remove surface contamination by steam, high pressure water or xylene solvent washing. Apply Vinyl etching primer then paint immediately, as per Manufacturers: Direction.

3.2.3.4.2. Oxidized: Remove contamination, apply oxidizing solution of copper acetate and ammonium chloride in acetic acid, and rub on repeatedly for correct effect. Finally, rinse well with clear water and let dry.

3.2.3.5. **Drywall**

3.2.3.5.1. Remove contamination, prime surface to show defects if any (defects to be repaired by others). After defects remedied carry on with paint coatings.

3.2.3.6. **Galvanized Steel**

3.2.3.6.1. Remove surface contamination, wash metal with xylene solvent and apply coat of an approved etching type primer.

3.2.3.7. **Zinc Coated Steel**

3.2.3.7.1. Remove surface contamination and prepare surface to material manufacturer's instructions for priming. Refer to Chapter 3 of CPCA.

3.2.3.8. **Masonry Surfaces and Concrete**

3.2.3.8.1. Remove dirt, loose mortar, scale, powder and other foreign matter. Oil and grease to be removed by solution containing T.S.P., then rinse and let dry. This is not to be construed to include cleaning, chipping or grinding of protrusions or filling of "honeycomb" holes, etc.

3.2.3.8.2. Concrete stains caused by weathering of corroding metals shall be removed with solution of sodium metasilicate after being thoroughly wetted with water. Let dry. This shall be corrected at no cost to the Painter.

3.2.3.9. **Plaster**

3.2.3.9.1. Hairline cracks, small holes and imperfections shall be corrected by the Plastering Contractor. Wash and neutralize high alkali surfaces where they occur.

3.2.3.10. **Structural and Miscellaneous Steel**

3.2.3.10.1. Surfaces shall be in a proper condition to receive paint finish with grease, rust, scale, dirt and dust removed. Where steel and iron have a heavy coating of scale, it shall be removed by wire brushing, sandblasting, etc., as necessary by others. All steel surfaces must be primed and satisfactory before paint finishing.

3.2.3.11. **Wood Plywood & Millwork**

3.2.3.11.1. All wood surfaces shall be clean and dry with a moisture reading of less than 15%. Remove all foreign matter prior to prime coat: knots, pitch streaks and sappy sections shall be spot coated with sealer. Fill all nail holes and fine cracks after primer has dried and sanded between coats. Backprime to interior and exterior woodwork.

3.2.4. **Previously Painted Surfaces**

3.2.4.1. **Interior**

3.2.4.1.1. Surfaces must be clean and dry and free of all grease, wax and dirt.

3.2.4.1.2. Remove grease, wax and dirt by washing with a good quality household cleaner. Rinse with clean water and let dry thoroughly before painting.

3.2.4.1.3. Remove all loose or peeling paint by scraping - feather edges with medium sandpaper.

3.2.4.1.4. Patch holes and crack with a good quality water-based patching compound, let dry and sand smooth. Remove dust and spot prime with Latex Sealer.

3.2.4.1.5. Sand glossy surfaces lightly with fine sandpaper to ensure proper adhesion.

3.2.4.1.6. Seal porous surfaces, such as flat latex, with Latex Sealer, especially if refinishing with velvet or eggshell enamels to prevent "flashing" or uneven gloss.

3.2.4.2. **Exterior**

3.2.4.2.1. Surfaces must be clean and dry and free of all grease, wax, dirt and mildew.

3.2.4.2.2. Mildew can be easily removed by washing with a chlorine bleach solution - about one litre of bleach to three litres of water. Rinse with clean water and let dry thoroughly before painting.

3.2.4.2.3. Remove all loose or peeling paint by scraping.

3.2.4.2.4. Patch holes and cracks with an exterior patching compound.

3.2.4.2.5. Re-caulk all open joints or cracks to prevent moisture entering wood or masonry.

3.2.4.2.6. Spot prime bare areas with the appropriate primer before painting.

3.2.4.2.7. Remove excess caulk by washing and/or sanding. Chalky surfaces to be sealed with a coat of Exterior Alkyd Primer.

3.2.4.2.8. Glossy surfaces should be dulled by light sanding with fine sandpaper to ensure proper adhesion.

3.2.5. **Application**

3.2.5.1. **General**

3.2.5.1.1. Method of paint application shall be generally by the accepted trade method.

3.2.5.1.2. Painting coats specified are intended to cover surfaces satisfactorily when applied in strict accordance to recommendations.

3.2.5.1.3. Apply each coat at the proper consistency.

3.2.5.1.4. Each coat of paint, shall be slightly darker than preceding coat unless otherwise approved.

3.2.5.1.5. Sand lightly between coats to achieve an anchor for the required finish.

3.2.5.1.6. Do not apply finishes on surfaces that are not sufficiently dry.

3.2.5.1.7. Each coat of finish should be dry and hard before a following coat is applied unless the manufacturer's directions state otherwise.

3.2.5.1.8. Tint filler to match wood when clear finishes are specified; work filler well into the grain and before it has set wipe the excess from the surface.

3.2.5.1.9. Finish glazing rebates before glazing commences.

3.2.5.1.10. Do not paint caulked joints.

3.2.5.1.11. On exterior work do not paint during temperatures under 5 deg C. or immediately following rain, frost or dew; on interiors do not paint during temperatures under 5 deg C. or on surfaces where condensation has formed or is likely to form. The minimum temperatures allowed for Latex paints shall be 7 deg. C. for interior work and 10 deg. C. for exterior work.

3.2.5.2. **General Colour Requirements**

3.2.5.2.1. Refer to the Colour/Room Finish Schedule for type and extent of finishes.
3.2.5.2.2. The following generally, will be painted colour, texture, and sheen to match adjacent surfaces; access doors, registers, radiators and covers, prime coated butts, prime coated door closers and exposed pipes.
3.2.5.2.3. Exterior and interior steel frames and trim generally will be of a different colour than adjacent walls.
3.2.5.2.4. Ceilings generally will be painted a different colour than walls. Doors generally will be painted a different colour than trim and walls. Door Frames are a different colour than doors and walls.
3.2.5.2.5. Existing steel lockers body/trim will be painted a different colour than adjacent walls, lockers doors will be a different colour from the locker body/trim.
3.2.5.2.6. This section shall figure on:
3.2.5.2.6.1.1. 2 different light colours
3.2.5.2.6.1.2. different dark colours (deep and bright included) Black Included.

3.2.5.3. **Priming and Backpriming**

3.2.5.3.1. Exterior woodwork which is to receive a paint finish shall be back-primed upon arrival at the job site with exterior primer paint, stain or varnish, depending on the finish.
3.2.5.3.2. Interior woodwork which is to receive paint or enamel finish shall be backprimed upon arrival at the job site with enamel undercoating paint.
3.2.5.3.3. Stain, or gloss varnish reduce as per manufacturer's directions.
3.2.5.3.4. Top and bottom edges of wood and metal doors shall be primed with undercoating, stain or varnish, depending on the finish specified.

3.2.5.4. **Painting**

3.2.5.4.1. For block filler apply as follows: Apply by airless spray followed by immediate back-rolling to uniform appearance. For airless spray use a 28 to 32 mil. Tip.
3.2.5.4.2. Apply paint by brush or rollers. Spray paint only when requested or approved, and in approved areas. Discontinue spraying if directed because of inadequate coverage, over spray, paint fog drift, or disturbance to construction operations.
3.2.5.4.3. Use only brushes for enamels and varnishes, and for painting wood.
3.2.5.4.4. Specified formulas are intended to completely cover surfaces. If it is considered that coverage is inadequate, do not commence application without direction. Otherwise, apply as many coats as necessary to ensure completely satisfactory cover.
3.2.5.4.5. Use only unadulterated paint. Thin paint as specified by manufacturer.
3.2.5.4.6. Touch up viable suction spots on dried primer and ensure that they are sealed before application of second coat. Repeat on second coat if still visible.

3.2.5.4.7. Do not paint metal access and electrical panels when they are closed. Paint when open and leave open until dry.

3.2.5.4.8. Where exposed to view, fill holes and open grain of exposed plywood edges with wood filler following prime coats. Smooth and sand before applying next coat.

3.2.5.5. **Staining**

3.2.5.5.1. Pad filler well into pores of open-grained wood with a circular rubbing motion. Clean surplus off by rubbing across the grain before filler dries.

3.2.5.5.2. Tint filler to match wood.

3.2.5.5.3. Where indicated in these specifications or on Drawings, wood is to receive either a "wiped" stain or solid stain.

3.2.5.5.3.1. Solid stain shall provide a uniform colour over the entire surface to receive the stain. Adjust stain colours as necessary to obtain the same colour over any variations between wood pieces.

3.2.5.5.3.2. "Wiped" stain shall provide a highlighting of the wood grain in the surfaces to receive this stain, with not more than 20% colour in open areas and not more than 80% colour in grain.

3.2.5.6. **Field Quality Control**

3.2.5.6.1. Alkali Content Tests: Use pink litmus paper for testing surfaces for alkalinity. Where extreme alkali conditions occur surfaces are to be neutralized by washing. Wash shall consist of a 4% solution of Zinc Sulphate.

3.2.5.6.2. Alkali content tests, and such other tests as shall be necessary, shall be performed by the Painter in collaboration with the painting inspector.

3.2.5.6.3. Painting Inspector to visit the site while painting and finishing applications are in progress. On each visit he shall verify that specified materials and methods are used, and that procedures agreed upon at the initial site meeting are followed.

3.2.5.6.4. Painting Inspector to submit reports of each site visit.

3.2.5.7. **Cleaning**

3.2.5.7.1. Promptly as the work proceeds and on completion of the work, removal paint where spilled, splashed or spattered' during the progress of the work keep the premises free from any unnecessary accumulation of tools, equipment, surplus materials and debris; at the conclusion of the work leave the premises neat and clean to the satisfaction of the Paint Inspector, Architect and/or Owner.

3.2.5.8. **Extra Stock**

3.2.5.8.1. Deliver to Owner on completion of painting and finishing, and as directed, sealed containers of each finish painting material applied, and in each colour. Label each container as for original, including mixing formula. Provide 4 L of extra stock when less than 50 L are used for project, 8 L of extra stock when 50 to 200 L are used, and 12 L of extra stock when over 200 L are used.

3.2.5.9. **Painting and Finishing Schedule**

3.2.5.9.1. **General**

3.2.5.9.1.1. This Section shall include painting and/or finishing of all surfaces exposed to view that have been installed with no final finish provided by the installer, unless otherwise specified and except for mechanical and service spaces.

3.2.5.9.1.2. Finish interior surfaces, including objects within each area unless otherwise excluded, as indicated on Finish Schedule.

3.2.5.9.1.3. Wall surfaces partially finished with other finish materials shall have remainder of surfaces finished as for surrounding surfaces.

3.2.5.9.1.4. An additional finish coat is required for dark colours and pastel colours.

3.2.5.9.1.5. Finish equipment, panels, fitments, services, structure, attachments, accessories, prime coated hardware, or similar appurtances on or near finished surfaces to match finish of the surface.

3.2.5.9.1.6. Finish edges and tops of trim, projecting ledges, fitments, cupboards, and similar surfaces to match adjacent surfaces, whether or not they are above or beyond sight lines.

3.2.5.9.1.7. Finish interiors of alcoves, recesses, closets, cupboards, fitments, and similar spaces to match adjacent surfaces unless otherwise indicated.

3.2.5.9.1.8. Finish surfaces visible through grilles, grille cloth, perforated metals, screening, convector covers, louvres, linear metal ceilings, and other openings, including inside of ductwork, with two coats of matte black paint. If it is the intention that finished surfaces be seen behind the elements listed above, finish the surfaces to match adjoining surfaces.

3.2.5.9.1.9. Finish exposed wood and exposed ferrous metals, whether primed or galvanized or not, on surfaces that are indicated as unfinished.

3.2.5.9.1.10. Paint exposed metal housings of weather stripping and door seals and door closers to match surface to which they are attached and which are painted or finished by this Section.

3.2.5.9.2. **Include Finishing of the Following Surfaces by This Section**

3.2.5.9.2.1. Steel lintels where exposed to view.
3.2.5.9.2.2. Interior ferrous metal hardware, fasteners and accessories, new and existing.
3.2.5.9.2.3. Interior galvanized hardware, fasteners and accessories, new and existing.
3.2.5.9.2.4. Exterior ferrous metal hardware, fasteners and accessories, new and existing.
3.2.5.9.2.5. Exterior galvanized hardware, fasteners and accessories.
3.2.5.9.2.6. Finish wood edges of new and existing doors and edges of new and existing metal doors exposed to view with same number coats of material and colour as adjoining surface finishes. Where not exposed, finish wood doors with two coats of varnish.
3.2.5.9.2.7. Paint exposed plywood edges of new and existing doors to match stained finish.
3.2.5.9.2.8. Paint new and existing metal door grilles to match door faces.
3.2.5.9.2.9. New and existing sheet metal ducts in interior spaces where exposed to view.
3.2.5.9.2.10. Sprinkler system except for heads where exposed to view.
3.2.5.9.2.11. Access doors, new and existing.
3.2.5.9.2.12. Baseboard units, new and existing.
3.2.5.9.2.13. Convector covers, new and existing.
3.2.5.9.2.14. Prime painted louvres, grilles, and diffusers at interior.
3.2.5.9.2.15. Prime painted louvres, grilles, and diffusers at exterior.
3.2.5.9.2.16. Prime painted fire hose and extinguisher cabinets.
3.2.5.9.2.17. Prime painted electrical panel doors and frames.
3.2.5.9.2.18. Paint new and existing piping and conduit exposed to view in finished areas. Colours to match adjacent surfaces.
3.2.5.9.2.19. Ensure that no colour coding or other identification of services that are applied by others are painted over by this Section.
3.2.5.9.2.20. Fill pipes.
3.2.5.9.2.21. Electrical service entry.
3.2.5.9.2.22. Mechanical, electrical and other equipment and accessories on roof including any existing items.

3.2.5.9.3. **Surfaces That Do Not Require Finishing**

3.2.5.9.3.1. Painting or finishing of the following surfaces is not included in this Section:

3.2.5.9.3.2. Plastics; metals with porcelain enamel, baked enamel or plated finishes; sound absorbent surfaces; vitreous, glazed ceramic or plastic facings; special coatings; factory finished surfaces as specified in other Sections; control panels, circuit breakers, switches, receptacles or similar electrical components; or name and specification plates on equipment; ducts, pipes and conduit concealed from view.

3.2.5.9.4. **Gloss**

3.2.5.9.4.1. Gloss value shall be determined in accordance with ASTM D523 Tentative Method of Test for 60° specular gloss.
3.2.5.9.4.2. Gloss required for each surface is noted on Room Finish Schedule.

3.2.5.10. **Finish Formula Schedule**

3.2.5.10.1. **General**

3.2.5.10.1.1. The following titles and code numbers refer to the Canadian Painting Contractors Architectural (CPCA) Painting Specification Manual, latest edition, unless otherwise Indicated for type of coating, grade, named products and their manufacturers.

3.2.5.10.2. **Exterior Woodwork** (Fences, Plywood, Partitions)

3.2.5.10.2.1. Ext. 1-A, Exterior Alkyd Finish, premium grade.
3.2.5.10.2.2. Ext. 1-D, Exterior Solid Colour Stain Finish, premium grade.
3.2.5.10.2.3. Ext. 1-F, Exterior Fire Retardant

3.2.5.10.3. **Exterior Wood Trim** (Doors, Door and Window Frames, Fascia)
3.2.5.10.3.1. Ext. 2-A, Exterior Alkyd Finish, premium grade.
3.2.5.10.3.2. Ext. 2-G, Exterior Pigmented Polyurethane Finish Type 2, premium grade.

3.2.5.10.4. **Exterior Concrete, Concrete Block, Masonry, Stucco, Stone**
3.2.5.10.4.1. Ext. 6-A, Latex Finish, Stucco, Bricks and Render, premium grade.
3.2.5.10.4.2. Ext. 6-B, Latex Finish, Concrete Block, premium grade.

3.2.5.10.5. **Exterior Structural and Misc. Steel** (Factory Primed)

3.2.5.10.5.1. Ext. 11-A, Alkyd Finish, premium grade.
3.2.5.10.5.2. Ext. 11-C, Aluminum Paint Finish, premium grade.
3.2.5.10.5.3. Ext. 11-D, Two Component Epoxy Finish, premium grade.

3.2.5.10.6. **Exterior Galvanized Metal** (Zinc Coated Steel).

3.2.5.10.6.1. Ext. 12-A, Alkyd Finish, premium grade.
3.2.5.10.6.2. Ext. 12-B, Aluminum Finish, premium grade.
3.2.5.10.6.3. Ext. 12-C, Bituminous Finish (Unexposed - next to concrete), Custom grade.

3.2.5.10.7. **Exterior Aluminium** (Flashings, misc. work, downpipes, etc.)

3.2.5.10.7.1. Ext. 13-A, Alkyd Finish on Exposed Aluminum, premium grade.
3.2.5.10.7.2. Ext. 13-C, Bituminous Finish on unexposed aluminum, custom grade.

3.2.5.10.8. **Exterior Copper**

3.2.5.10.8.1. Ext. 14-A, exposed Alkyd Finish, premium grade.
3.2.5.10.8.2. Ext. 14-C, Bituminous Finish unexposed next to concrete or wood, premium grade.

3.2.5.10.9. **Exterior Steel - High Heat**

3.2.5.10.9.1. Ext. 15-B, Heat Resistant Enamel Finish, follow manufacturer's recommendations for application.

3.2.5.10.10. **Interior Wood** (wood trim, benches, wood doors and frames, cabinets etc.)

3.2.5.10.10.1. Int. 1-B, Latex Finish, premium grade.
3.2.5.10.10.2. Int. 1-C, Semi Transparent Alkyd Stain Finish, premium grade.
3.2.5.10.10.3. Int. 1-D, Semi Transparent Stain Polyurethane Varnish, premium grade.
3.2.5.10.10.4. Int. 1-I, Clear Polyurethane, premium grade.
3.2.5.10.10.5. Int. 1-J, Fire Retardant Solvent Base Pigmented Finish, follow manufacturers' instructions to apply.
3.2.5.10.10.6. Int. 1-K, Fire Retardant Clear Finish, follow manufacturers' instructions to apply.
3.2.5.10.10.7. Int. 1-L, Chemical Resistant Finish Shelving, Cupboards, Etc, premium grade.

3.2.5.10.11. **Interior Plaster, Drywall Etc.**

3.2.5.10.11.1. Int. 4-B, Latex Finish, premium grade.
3.2.5.10.11.2. Int. 8-D, 1 coat: Glidden Professional, GP 1000 High Hide Interior Primer Sealer
3.2.5.10.11.3. coats: Glidden Professional, 4426 Tru-Glaze-WB 4426 Waterborne Epoxy Semi-Gloss Coating
3.2.5.10.11.4. Int. 4-G, Fire Retardant Coating Latex. Follow manufacturers' recommendations for application.

3.2.5.10.12. **Interior Canvas And Cotton Insulation Coverings** (pipes, and ductwork, boilers)

3.2.5.10.12.1. Int. 5-B, Aluminum Paint Finish, premium finish.
3.2.5.10.12.2. Int. 5-C, Latex Finish, premium grade.

3.2.5.10.13. **Interior New Acoustic Plaster, Tile and Textured Ceilings**

3.2.5.10.13.1. Int. 6-C, Custom grade.

3.2.5.10.14. **Interior Concrete, Masonry, Stucco.**

3.2.5.10.14.1. Int. 7-A, Latex Finish, premium grade.
3.2.5.10.14.2. Int. 7-D, Water Based Tile-Like Finish on Smooth Concrete, premium grade.

3.2.5.10.15. **Interior Concrete Block, and Concrete Brick**

3.2.5.10.15.1. Int. 8-A, Latex Finish, premium grade.
3.2.5.10.15.2. Int. 8-D, 2 coats: Glidden Professional, 4426 Tru-Glaze-WB 4426 Waterborne Epoxy Semi-Gloss Coating

3.2.5.10.16. **Interior Structural And Misc. Steel** (Factory-Primed)

3.2.5.10.16.1. Int. 12-A, Alkyd Finish, premium grade.
3.2.5.10.16.2. Int. 12-D, Two Component Epoxy Finish, premium grade.

3.2.5.10.17. **Interior Galvanized Metal** (Zinc Coated Steel)

3.2.5.10.17.1. Int. 13-A, Alkyd Finish, premium grade.
3.2.5.10.17.2. Int. 13-D, Latex Finish, premium grade.

3.2.5.10.18. **Interior High Heat Steel** (Boilers, Breeching, pipelines. etc.)

3.2.5.10.18.1. Int. 14-B, Heat Resistant Enamel Finish, follow manufacturers' instructions for application.
3.2.5.10.18.2. Int. 14-E, Heat Resistant Enamel Finish, for temp. between 315 to 425 deg. C. follow manufacturers' instructions for application.

3.2.5.10.19. **Interior Aluminum**

3.2.5.10.19.1. Int. 15-A, Alkyd Finish, premium grade.

End of Section

PART 1 - GENERAL

1.1. Description

1.1.1. General Requirements

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

1.1.2. Work performed by other Sections related to this Section is specified in:

Section 08800: Mirrors
Division 15: Plumbing fixtures
Division 16: Service for electric dryers

1.2. Submittals

1.2.1. Shop Drawings

1.2.1.1. Submit shop drawings

1.2.2. Samples

1.2.2.1. Submit samples of accessories that are requested.

1.3. Delivery, Storage and Handling

1.3.1. Package accessories and label with description of contents and installation location.

1.3.2. Deliver accessories where designated at site by Contractor.

PART 2 - PRODUCTS

2.1. Products

2.1.1. Specified manufacturer's catalogue references to Bobrick Washroom Equipment establish minimum acceptable standards for products specified in this section except where another manufacturer is specifically listed.

2.1.2. Unspecified materials which form a part of complete assemblies shall be of manufacturer's standard.

2.1.3. Toilet Tissue Dispenser

Location:	At each new water closet as noted in drawings.
Mounting:	Surface
Operation:	Dual roll with theft resistant spindle
Finish:	satin finish on cast aluminum
Model:	B-274

2.1.4. **Mirrors**

Location:	As indicated on drawings.
Size:	460 x 900.
Frame:	19 mm wide, Type 304 stainless steel, satin finish.
Glass:	6 mm thick Tempered and plate/float glass, electronically plated.
Model:	B-290 1830

2.1.5. **Tilt Mirrors**

Location:	As indicated on drawings.
Size:	460 x 900.
Frame:	19 mm wide, Type 304 stainless steel, satin finish.
Glass:	6 mm thick tempered and plate/float glass, electronically plated.
Model:	B-293 1830

2.1.6. **Soap Dispensers**

Location:	As indicated on drawings.
Mounting:	surface
Finish:	Stainless Steel, satin finish
Model:	B-2111

2.1.7. **Soap Dishes**

Location:	In room 103B
Mounting:	Semi-recessed
Finish:	Stainless Steel, satin finish.
Model:	B-7680

2.1.8. **Electric Hand Dryers**

Location:	As indicated on drawings.
Mounting:	Surface
Finish:	Stainless steel satin finish on exposed trim, porcelain enamel in colours to be selected (maximum 2 colours per project)
Electrical:	115 volt, 20 amp, single phase, 2300 watt
Operation:	automatic
Model:	B-7017

2.1.9. **Electric Hair Dryers**

Location:	In room 103B
Mounting:	Surface
Finish:	Stainless steel satin finish on exposed trim, porcelain enamel in colours to be selected (maximum 1 colours per project)
Electrical:	115 volt, 20 amp, single phase, 2300 watt
Operation:	manual, push button
Model:	B-7817.

2.1.10. **Paper Towel Dispensers**

Location:	As indicated on drawings.
Mounting:	surface
Finish:	Stainless Steel, satin finish
Model:	B-262

2.1.11. **Waste Disposal**

Location:	As indicated on drawings.
Mounting:	semi recessed
Finish:	Type 304 stainless steel, satin finish
Model:	B-367034

2.1.12. **Sanitary Napkin Disposal**

Location:	As indicated on drawings.
Mounting:	surface
Operation:	hinged top cover with full length piano hinge keyed bottom access door with full length piano hinge
Finish:	Type 302 stainless steel, satin finish
Model:	B-270

2.1.13. **Towel/Robe Hooks**

Location:	In room 103B
Mounting:	surface
Materials:	Type 304 stainless steel for flanges, concealed wall plates, mounting brackets, post and cap complete with lock screws.
Finish:	satin finish
Model:	B-76727

2.1.14. **Shower Curtain Rod**

Location:	In room 103B
Mounting:	surface
Materials:	Rod - heavy duty, 20 gauge, Type 304 stainless steel, 30 mm diameter Flanges - 65 mm square, Type 304 stainless steel
Finish:	satin finish
Model:	B-6047

2.1.15. **Shower Curtain**

Location:	In room 103B
Mounting:	surface
Materials:	opaque, matte white vinyl, 0.2 mm thickness, with nikel plated brass grommets spaces at 152 mm on centre, bottoms and edges hemmed
Model:	204-2 complete with 204-1 stainless steel curtain hooks

2.1.16. **Shower Seat**

Location:	In room 103B
Mounting:	surface
Operation:	self locking mechanism
Finish:	Frame - Type 304 stainless steel, satin finish Seat - solid phenolic slats
Model:	B-5191

2.1.17. **Grab Bars**

2.1.17.1. **Type 1**

Location:	As indicated on drawings.
Mounting:	surface with exposed flanges, for horizontal and vertical installation
Material:	18 gauge, type 304 stainless steel, 32 mm diameter
Finish:	polished ends with peened grips
Model:	B-490 x 610 mm

2.1.17.2. **Type 2**

Location:	As indicated on drawings.
Mounting:	surface with exposed flanges
Material:	18 gauge, type 304 stainless steel, 32 mm diameter
Finish:	polished ends with peened grips
Model:	B-4961 and to suit dimensions on floor plan

2.1.18. **Baby Change Station**

Location:	As indicated on drawings.
Mounting:	As per manufacturers requirements
Model:	Koala – KB100

2.2. Fabrication

2.2.1. Include reinforcing, anchorage and mounting devices required for the installation of each product.

2.2.2. Fit joints and junctions between components tightly and in true planes, conceal and weld joints where possible.

2.2.3. Fabricate products with materials and component sizes, metal gauges, hardware, reinforcing, anchors, and fastenings of adequate strength to ensure that products will remain free of warping, buckling, opening of joints and seams, and distortion within limits of intended use.

2.3. Installation

2.3.1. Provide manufacturer's handling instructions, anchorage information, roughing-in dimensions, and templates for installation of products specified in this Section.

2.3.2. Install products only as specified by manufacturer..3 Install grab bars in accordance with OBC.

2.3.3. Verify location and mounting heights of products with Architect before roughing-in or installation.

2.3.4. Install products plumb, level, straight, tight and secure to mounting surfaces, and centred between joints on masonry and tile walls.

2.3.5. Attach accessories to walls with only
: 38 mm long expansion shields in solid masonry or in concrete.
: toggle bolts in cells of hollow masonry units.
: sheet metal screws into metal framing and finish of fastened products where exposed to view.
: the attachment of toilet tissue dispensers shown back-to-back shall be bolted through metal partition.

2.4. Adjustment and Cleaning

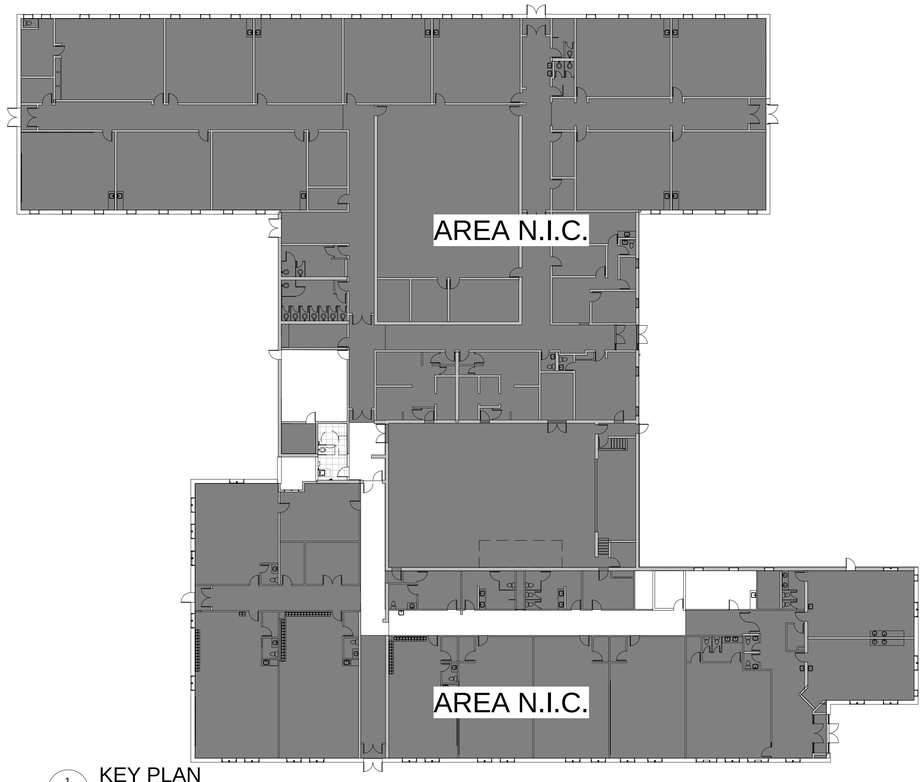
2.4.1. Adjust operating units to ensure free-acting, tightly closing, and properly functioning operation. Lubricate as required.

2.4.2. Refinish damaged or defective products so that no variation in surface appearance is discernible. Refinish products at site only if approved.

End of Section

OUR LADY OF FATIMA SCHOOL RENEWAL - PHASE II

545 BALDOON ROAD, CHATHAM ON N7L 4T8



1 / A000 KEY PLAN

1 : 250

Sheet List	
Sheet Number	Sheet Name
01 ARCHITECTURAL	
A000	COVER PAGE
A010	LIFE SAFTEY PLAN
A050	GENERAL NOTES
AD100	DEMOLITION PLAN
AD200	REFLECTED CEIL. DEMO PLAN
AD400	DEMOLITION SECTIONS
A100	CONSTRUCTION FLOOR PLAN
A150	ENLARGED FLOOR PLANS
A200	REFLECTED CEILING PLAN
A300	EXTERIOR ELEVATIONS
A301	EXTERIOR ELEVATIONS
A500	WALL SECTIONS
A502	WALL SECTIONS
A600	PLAN DETAILS
A625	WINDOW DETAILS
A650	SECTION DETAILS
A675	SECTION DETAILS
A800	FINISHING PLAN
A850	INTERIOR ELEVATIONS
A1000	SCHEDULES
02 STRUCTURAL	
S101	STRUCTURAL
03 CIVIL	
SE1	SITE SERVICING & GRADING PLAN
SE2	NOTES AND DETAILS

Sheet List	
Sheet Number	Sheet Name
04 ELECTRICAL	
E100	ELEC. 001
E200	ELEC. 002
05 MECHANICAL	
M101	MECHANICAL 001
M102	MECHANICAL 002

Firm Name: Wilson Diaz Architects Inc.
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280 Queens Ave. Suite 1Q
London, Ont. N6B 1X3
p. 519-439-0611 f. 519-438-5962
The Certificate of Practice Number of the holder Is the holder's BCDN.

Name of Project:
Our Lady of Fatima – Chatham ON
SCCDSB

Location:
545 Baldoon Rd, Chatham, ON N7M 5J7

ONTARIO ASSOCIATION OF ARCHITECTS
RANDY R. WILSON
LICENCE
4000

The architect noted above has exercised responsible control with respect to design activities. The architect's seal number is the architect's BCDN.

Item	Ontario's 2006 Building Code Data Matrix Part 3 or 9			OBC Reference	
				References are to Division B unless noted [A] for Division A or [C] for Division C.	
1	Project Description:	☐ New ☐ Addition ☐ Change of Use ■ Alteration	■ Part 11 11.1 to 11.4	■ Part 3 1.1.2. [A]	☐ Part 9 1.1.2. [A] & 9.10.1.3.
2	Major Occupancy(s)			3.1.2.1.(1)	9.10.2.
3	Building Area (m²)	Existing 3871m² New 0 m² Total 3871 m²		1.4.1.2. [A]	1.4.1.2. [A]
4	Gross Area	Existing 3871m² New 0 m² Total 3871 m²		1.4.1.2. [A]	1.4.1.2. [A]
5	Number of Storeys	Above grade 1 Below grade 0		1.4.1.2. [A]&3.2.1.1.	1.4.1.2[A] & 9.10.4
6	Number of Streets/Fire Fighter Access	1 STREET (EXISTING)		3.2.2.10. & 3.2.5.	9.10.20.
7	Building Classification: 3.2.2.26. Group A, Division 2, up to 2 Storeys, Increased Area, Sprinklered			3.2.2.20.-83	9.10.2.
8	Sprinkler System Proposed	☐ entire building ☐ selected compartments ☐ selected floor areas ☐ basement ☐ in lieu of roof rating ■ not required		3.2.2.20.-83 3.2.1.5. 3.2.2.17. INDEX	9.10.8.2. INDEX
9	Standpipe required	☐ Yes ■ No		3.2.9.	N/A
10	Fire Alarm required	■ Yes ☐ No		3.2.4.	9.10.18.
11	Water Service/Supply is Adequate	■ Yes ☐ No		3.2.5.7.	N/A
12	High Building	☐ Yes ■ No		3.2.6.	N/A
13	Construction Restrictions Actual Construction	☐ Combustible permitted ☐ Combustible	☐ Non-combustible required ■ Both ☐ Non-combustible ■ Both	3.2.2.20.-83	9.10.6.
14	Mezzanine(s) Area m² N/A			3.2.1.1.(3)-(8)	9.10.4.1.
15	Occupant load based on	☐ m²/person	■ design of building 420 Persons	3.1.17.	9.9.1.3.
16	Barrier-free Design	■ Yes ☐ No (Explain)		3.8.	9.5.2.
17	Hazardous Substances	☐ Yes ■ No		3.3.1.2. & 3.3.1.19.	9.10.1.3.(4)

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Name of Project:
Our Lady of Fatima – Chatham ON
SCCDSB

Location:
545 Baldoon Rd, Chatham, ON N7M 5J7

The architect noted above has exercised responsible control with respect to design activities. The architect's seal number is the architect's BCDN.

Ontario Building Code Data Matrix – Part 11 – Renovation of Existing Building					OBC Reference
11.1	Existing Building classification:	Describe Existing Use: Group A-2 Construction Index: 4 Hazard Index: 6 ☐ Not Applicable (no change of major occupancy)			11.2.1 T 11.2.1.1A T 11.2.1.1B to N
11.2	Alteration to Existing Building is:	Basic Renovation ■ Extensive Renovation ☐			11.3.3.1 11.3.3.2
11.3	Reduction in Performance Level:	Structural: By Increase in occupant load: By change of major occupancy: Plumbing: Sewage-system:	■ No ■ No ■ No ■ No ■ No	☐ Yes ☐ Yes ☐ Yes ☐ Yes ☐ Yes	11.4.2 11.4.2.1 11.4.2.2 11.4.2.3 11.4.2.4 11.4.2.5
11.4	Compensating Construction:	Structural Increase in occupant load: Change of major occupancy: Plumbing: Sewage System:	■ No ■ No ■ No ■ No ■ No	☐ Yes (explain) ☐ Yes (explain) ☐ Yes (explain) ☐ Yes (explain) ☐ Yes (explain)	11.4.3 11.4.3.2 11.4.3.3 11.4.3.4 11.4.3.5 11.4.3.6
11.5	Compliance Alternatives Proposed:	■ No ☐ Yes (give number(s)) _____			11.5.1
11.6	Alternative Measures Proposed:	■ No ☐ Yes (explain) _____ _____			11.5.2

WASHROOM COUNT

OCCUPANT LOAD:
CHILDCARE: 66
STUDENTS: 420
TEACHERS: 26
TOTAL: 512

TOTAL NUMBER OF EXIST. W.C: 40
TOTAL NUMBER OF NEW W.C: 33
MEN: 24
WOMEN: 24

NUMBER OF REQUIRED W.C:
MEN: 9
WOMEN: 10

ARCHITECT

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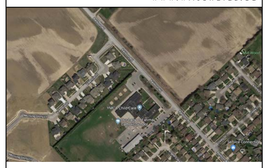


KEY PLAN

TRUE NORTH

CONSTRUCTION NORTH

NOTES

LEGEND

Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

ONTARIO ASSOCIATION OF ARCHITECTS
RANDY R. WILSON
LICENCE
4000

PROJECT TITLE
OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

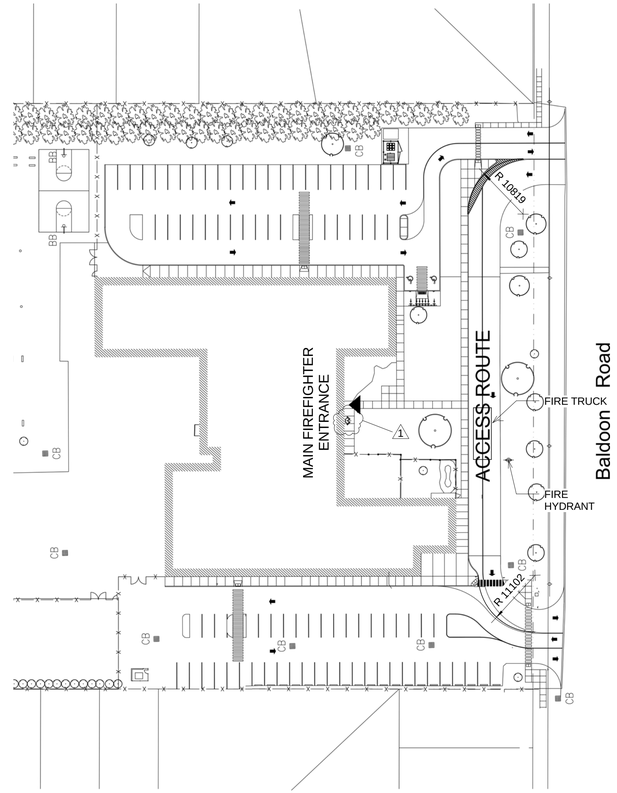
DRAWING TITLE
COVER PAGE

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A000
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		

1 A010

LIFE SAFTY PLAN

1 : 200



2 A010

FIRE ACCESS ROUTE

1 : 500

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KEY PLAN

TRUE NORTH | CONSTRUCTION NORTH

NOTES

LEGEND

- 30 MINUTE FIRE SEPARATION
- 45 MINUTE FIRE SEPARATION
- 1 HOUR FIRE SEPARATION

Date	Description	No.
Date 1	Revision 1	1
5/18/2018	ISSUED FOR TENDER	1

ONTARIO ASSOCIATION OF ARCHITECTS
RANDY R. WILSON
LICENCE
4000

PROJECT TITLE
OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

DRAWING TITLE
LIFE SAFTEY PLAN

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A010
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		

GENERAL NOTES:

A. REMOVE ALL WIRING FROM ELECTRICAL DEVICES THAT WILL BE REMOVED AND ALL REDUNDANT CONDUIT BACK TO NEAREST JUNCTION BOX THAT WILL REMAIN, AND MAKE SAFE. INSTALL METAL COVER PLATES OVER EXPOSED OPENINGS AND ELECTRICAL BOXES. REFER TO ELECTRICAL FOR ADDITIONAL REQUIREMENTS.

B. MAKE GOOD ALL AREAS AFFECTED BY REMOVALS - FLUSH TO ADJACENT SURFACE AND MATCH TO EXISTING FINISH.

C. DISPOSE OF ALL DESIGNATED SUBSTANCES TO THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION

D. ALL PIPING THAT IS TO BE REMOVED OR ABANDONED IS TO BE REMOVED BACK TO THE NEAREST JUNCTION AND CAPPED. REFER TO MECHANICAL FOR ADDITIONAL REQUIREMENTS.

E. NOTE ALL EXISTING ITEMS MAY NOT BE SHOWN ON THESE DRAWINGS. A CAREFUL REVIEW OF THE SITE IS REQUIRED TO DETERMINE THE FULL EXTENT OF THE WORK SHOWN, CONTACT ARCHITECT PRIOR TO BID CLOSE TO CONFIRM.

F. THE ARCHITECTURAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL PROJECT MANUALS, STRUCTURAL, CIVIL, MECHANICAL AND ELECTRICAL DRAWINGS. IN CASE OF DIFFERENCES BETWEEN CONSULTANTS' DOCUMENTS WITH RESPECT TO QUANTITY, SIZES OR SCOPE, THE GREATER SHALL APPLY.

G. PROVIDE PROTECTION FOR ALL FINISHES OR SERVICES TO REMAIN.

H. ALL WINDOWS FALLING WITHIN THE DEMOLITION AREA ARE TO HAVE THEIR COVERINGS, FITTINGS, AND MOUNTING HARDWARE REMOVED & RETURNED TO THE OWNER.

I. DEMOLITION NOTE REFERENCE NUMBERS, WHERE LOCATED ADJACENT TO A ROOM NAME/NUMBER APPLY TO THE ENTIRETY OF THE ROOM.

J. GENERAL CONTRACTOR IS TO ALLOW FOR THE SUPPLY AND INSTALLATION OF LOOSE LINTELS AS REQUIRED WHERE NEW OPENINGS ARE BEING CREATED OR WIDENED. REFER TO THE LOOSE LINTEL SCHEDULE PROVIDED ON THE DRAWINGS, OR PROVIDE ENGINEERING WHERE THERE ARE NO STRUCTURAL DRAWINGS OR SCHEDULE.

K. GENERAL CONTRACTOR IS REQUIRED TO REMOVE ALL REMAINING ADHESIVES ON WALLS WHERE COMMUNICATION BOARDS WERE REMOVED UNLESS BEING COVERED WITH NEW BOARDS. TYPICAL FOR ALL ROOMS AFFECTED BY WORK.

DEMOLITION NOTES:

1. REMOVE EXISTING WALLS AS INDICATED ON THE DRAWINGS. CONSTRUCTION TYPE MAY VARY FROM EXTERIOR MASONRY ON CONCRETE BLOCK BACKUP TO INTERIOR CONCRETE BLOCK AND/OR DRYWALL PARTITIONS. REMOVE MECHANICAL AND ELECTRICAL COMPONENTS / DEVICES (BACK TO SOURCE) ANCHORED TO OR CONCEAL WITHIN WALLS. PROVIDE ALL SHORING AND TEMPORARY SUPPORT REQUIRED TO MAKE EXISTING STRUCTURE SAFE. REFER TO DRAWINGS & SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. EXISTING DOOR, AND FRAME IF INDICATED, TO BE REMOVED. BOX, LABEL AND TURN OVER HARDWARE TO OWNER FOR FUTURE USE. WHERE FRAME IS REMOVED PREPARE OPENING TO RECEIVE NEW INFILL OR DOOR AND FRAME. REFER TO NEW CONSTRUCTION PLANS AND ELEVATIONS.
3. REMOVE & DISPOSE OF EXISTING EXTERIOR BRICK AND RIGID INSULATION BACK TO EXISTING CONC. BLOCK. WALL CONC. BLOCK STRUCTURE TO REMAIN. MAKE READY FOR NEW MASONRY.
4. REMOVE AND DISPOSE OF EXISTING WINDOW AND FRAME.
5. AREA OF EXISTING CONCRETE FLOOR SLAB TO BE BROKEN UP FOR INSTALL OF NEW PLUMBING LINES.
6. REMOVE & DISPOSE OF EXISTING CANOPY SIDING, SOFFIT, AND PARAPET. CANOPY STRUCTURE TO REMAIN. REFER TO DWGS.
7. CUT OPENING IN EXIST CMU WALL FOR NEW WINDOW INSTALLATION.
8. CUT BACK, BREAKUP AND REMOVE AREA OF EXISTING SIDEWALK AND/OR ASPHALT @ EXIST. CONTROL JOINTS/SAW CUTS. PROVIDE NEW CONCRETE PAD TO OPSB STANDARDS FOR SIDEWALKS.
9. CAREFULLY REMOVE ALL CEILING TREATMENTS SO AS TO NOT DAMAGE LAY-IN ACOUSTIC TILE. SAFELY STORE TILE FOR LATER REUSE IN EXISTING LAT GRID.

SYMBOL	DESCRIPTION
1	DEMOLITION NOTE REFERENCE NUMBER
	AREA OF WORK N.I.C.
	PORTION OF EXISTING WALLS TO BE REMOVED
	EXTERIOR MASONRY & INSULATION TO BE REMOVED
	EXISTING CONC. BLOCK TO REMAIN
	AREA OF CONCRETE FLOOR TO BE REMOVED FOR PLUMBING
	EXISTING DOOR & FRAME TO REMAIN
	EXISTING DOOR & FRAME TO BE REMOVED
	EXISTING WINDOW & FRAME TO BE REMOVED
	EXISTING WINDOW & FRAME TO REMAIN

ASSEMBLY TYPES:

EXTERIOR WALL TYPES

TYPE	DETAIL	DESCRIPTION
EXIST.		EXISTING WALL: -90 CLAY BRICK -25 RIGID INSULATION -190 CONC. BLOCK
EW1		MASONRY ON EXIST. CMU: -90 CSBU MASONRY -25 AIR BARRIER -80 SPRAY FOAM INSULATION -BLUESKIN SA WATER RESISTIVE A.B. AT TRANSITIONS* -NEW 190 CONC. BLOCK
EW1.1		MASONRY ON EXIST. CMU: -90 CSBU MASONRY -25 AIR BARRIER -80 SPRAY FOAM INSULATION -BLUESKIN SA WATER RESISTIVE A.B. AT TRANSITIONS* -EXISTING 190 CONC. BLOCK
EW1.2		NSMU BASE: -90 LIMESTONE MASONRY -25 AIR BARRIER -80 SPRAY FOAM INSULATION -BLUESKIN SA WATER RESISTIVE A.B. AT TRANSITIONS* -EXISTING 190 CONC. BLOCK
EW1.3		METAL SIDING ON EXST. CMU: -22 GAUGE HORIZONTAL CORRUGATED METAL SIDING -VERTICAL Z-BAR REINFORCING -25 AIR BARRIER -80 SPRAY FOAM INSULATION -BLUESKIN SA WATER RESISTIVE A.B. AT TRANSITIONS* -EXISTING 190 CONC. BLOCK

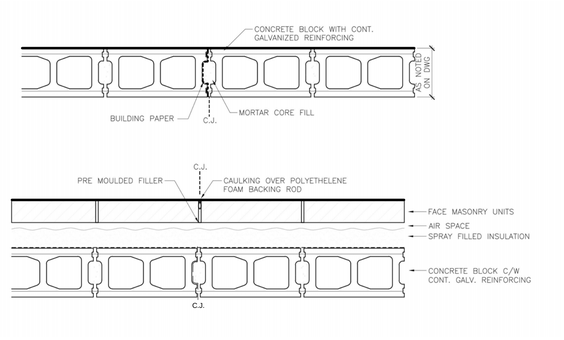
INTERIOR WALL TYPES

TYPE	DETAIL	DESCRIPTION
IW3.1		EXPOSED CMU: -NEW 190 CMU
IW3.2		GWB ON CMU: -16 GWB -NEW 190 CMU -16 GWB
IW3.3		GWB ON CMU: -NEW 190 EXPOSED CMU -16 GWB

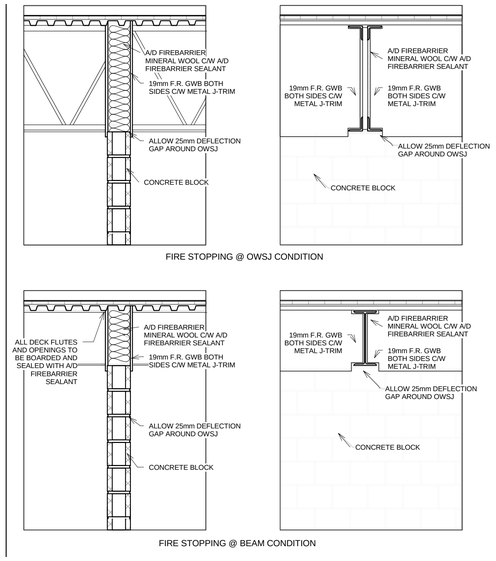
CEILING TYPES

TYPE	DETAIL	DESCRIPTION
ACT HT A.F.F.		ACOUSTIC CEILING TILE: -ACT PANEL -ALUM. CHANNEL SYS.

* BLUESKIN TO BE INSTALLED AT ALL MATERIAL TRANITIONS, JOINTS, WINDOW AND DOOR OPENINGS, PARAPET CAPS AND WALL PENETRATIONS



4 / A050 CONTROL JOINT DETAILS
1 : 10



5 / A050 FIRE STOP DETAILS
1 : 10

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KEY PLAN

TRUE NORTH | CONSTRUCTION NORTH

NOTES

LEGEND

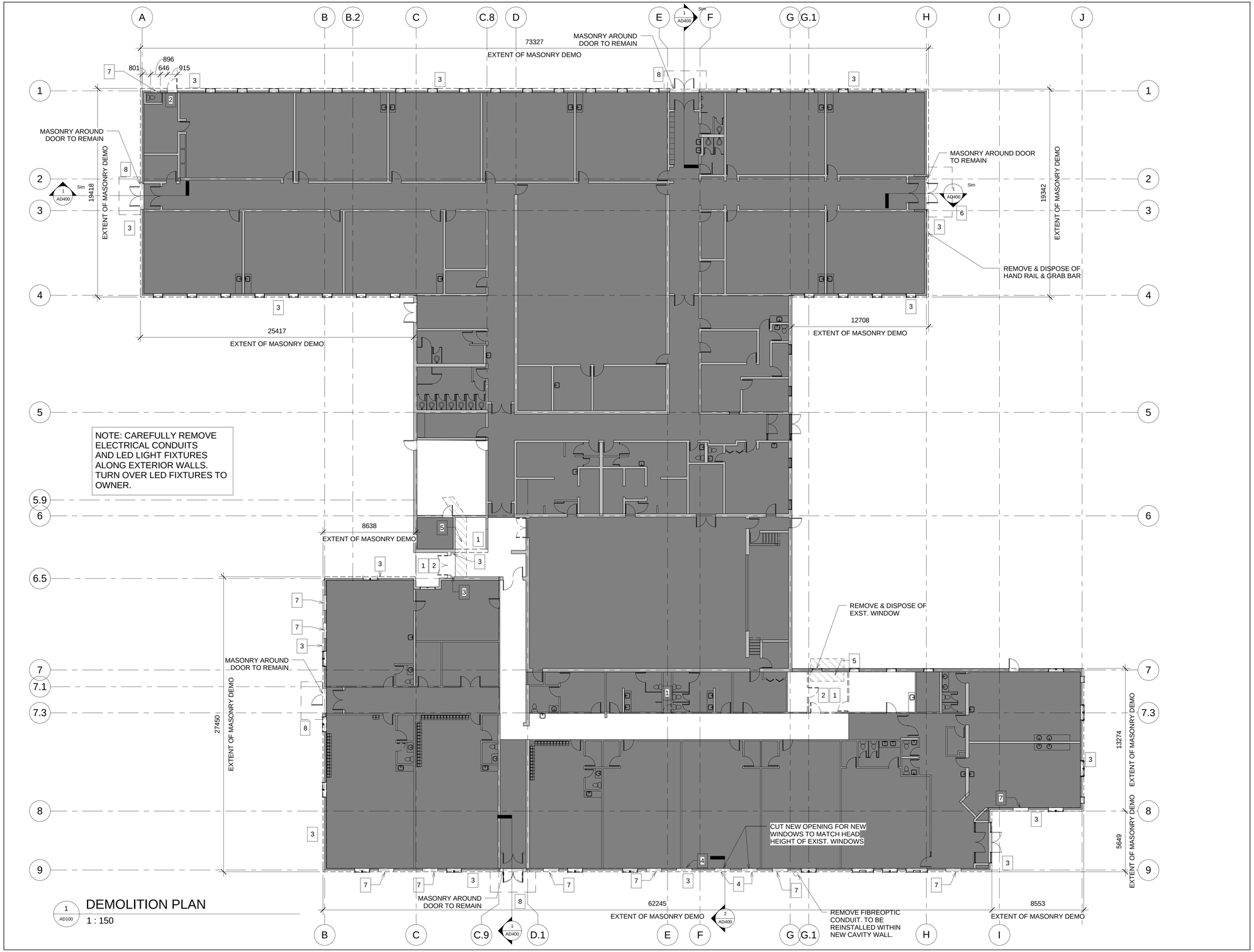
Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

ONTARIO ASSOCIATION OF ARCHITECTS
RANDY R. WILSON
LICENCE 4000

PROJECT TITLE
OUR LADY OF FATIMA PHASE 2 RENEWAL REDUCED SCOPE

DRAWING TITLE
GENERAL NOTES

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A050
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



1 AD100 DEMOLITION PLAN

1 : 150

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NOTES

LEGEND

SYMBOL	DESCRIPTION
1	DEMOLITION NOTE REFERENCE NUMBER
	AREA OF WORK N.I.C.
	ACT CEILING TILE TO BE REMOVED
	PORTION OF EXISTING WALLS TO BE REMOVED
	EXTERIOR MASONRY & INSULATION TO BE REMOVED
	EXISTING CONC. BLOCK TO REMAIN
	AREA OF CONCRETE FLOOR TO BE REMOVED FOR PLUMBING
	EXISTING DOOR & FRAME TO REMAIN
	EXISTING DOOR & FRAME TO BE REMOVED

Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

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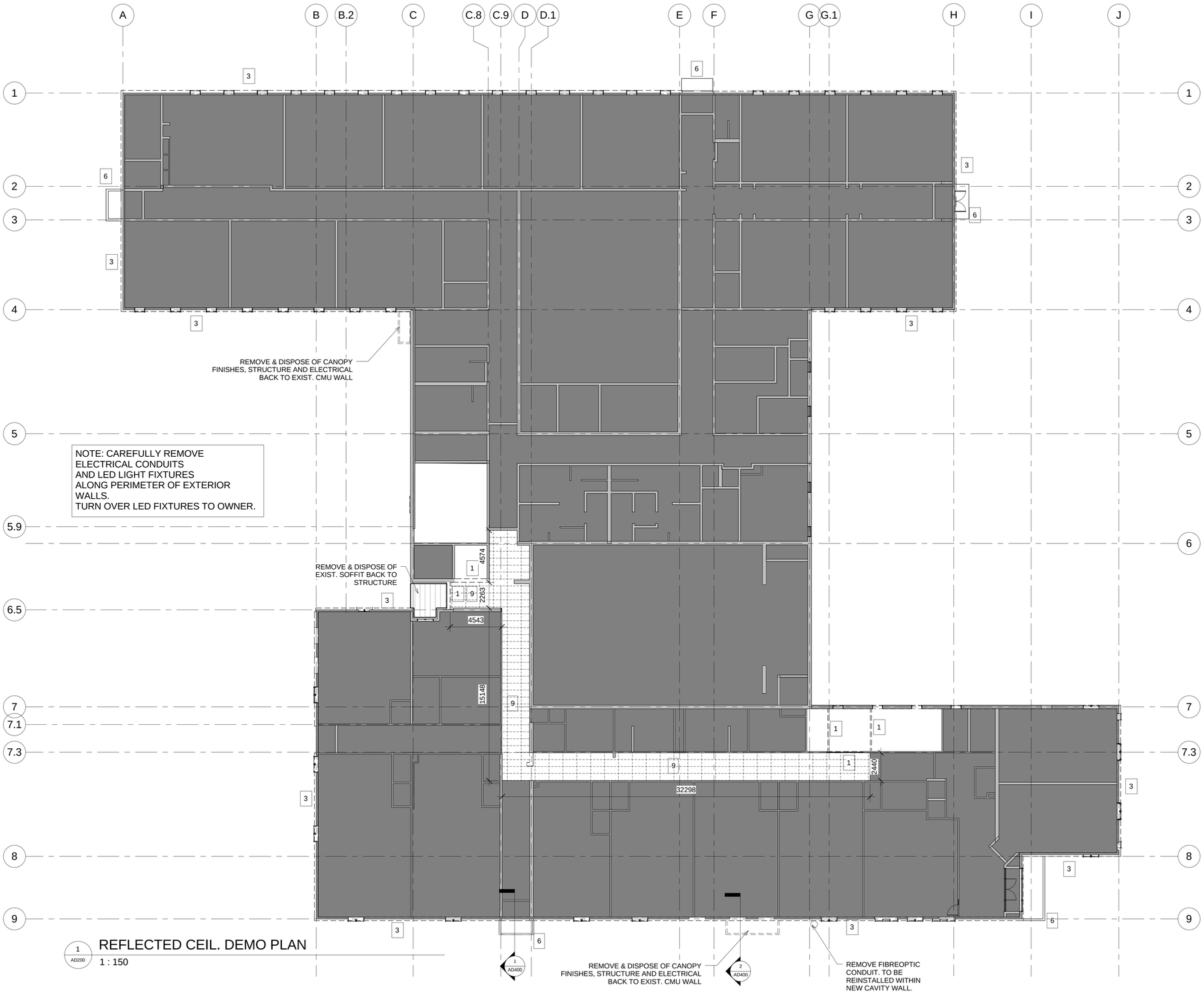
PROJECT TITLE

OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

DRAWING TITLE

DEMOLITION PLAN

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	AD100
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



1 AD200 REFLECTED CEIL. DEMO PLAN

1 : 150

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LEGEND

SYMBOL	DESCRIPTION
1	DEMOLITION NOTE REFERENCE NUMBER
	AREA OF WORK N.I.C.
	ACT CEILING TILE TO BE REMOVED
	PORTION OF EXISTING WALLS TO BE REMOVED
	EXTERIOR MASONRY & INSULATION TO BE REMOVED
	EXISTING CONC. BLOCK TO REMAIN
	AREA OF CONCRETE FLOOR TO BE REMOVED FOR PLUMBING
	EXISTING DOOR & FRAME TO REMAIN
	EXISTING DOOR & FRAME TO BE REMOVED

Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

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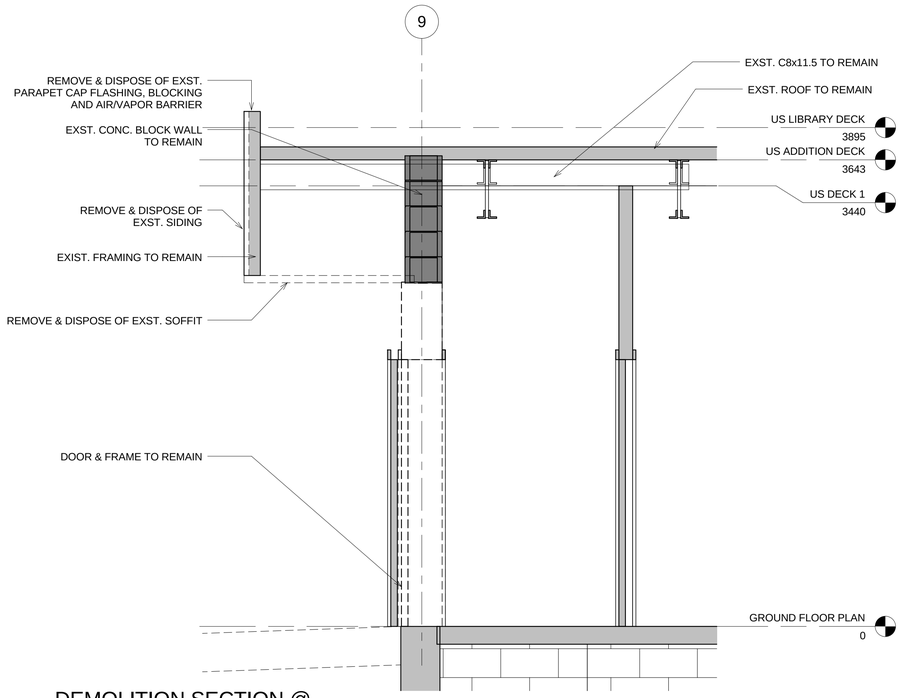
DRAWING TITLE

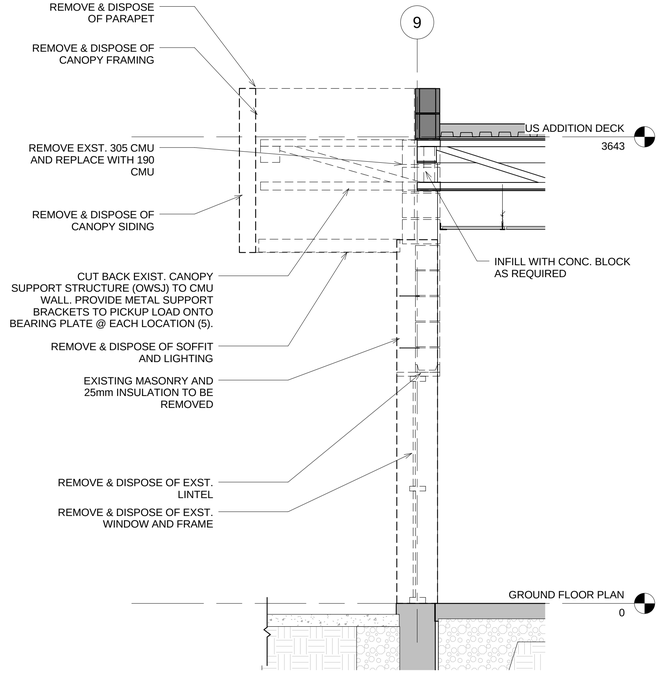
REFLECTED CEIL. DEMO PLAN

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	AD200
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



1 AD400 DEMOLITION SECTION @ VESTIBULES

1 : 20



2 AD400 DEMO SECTION @ CANOPY

1 : 20

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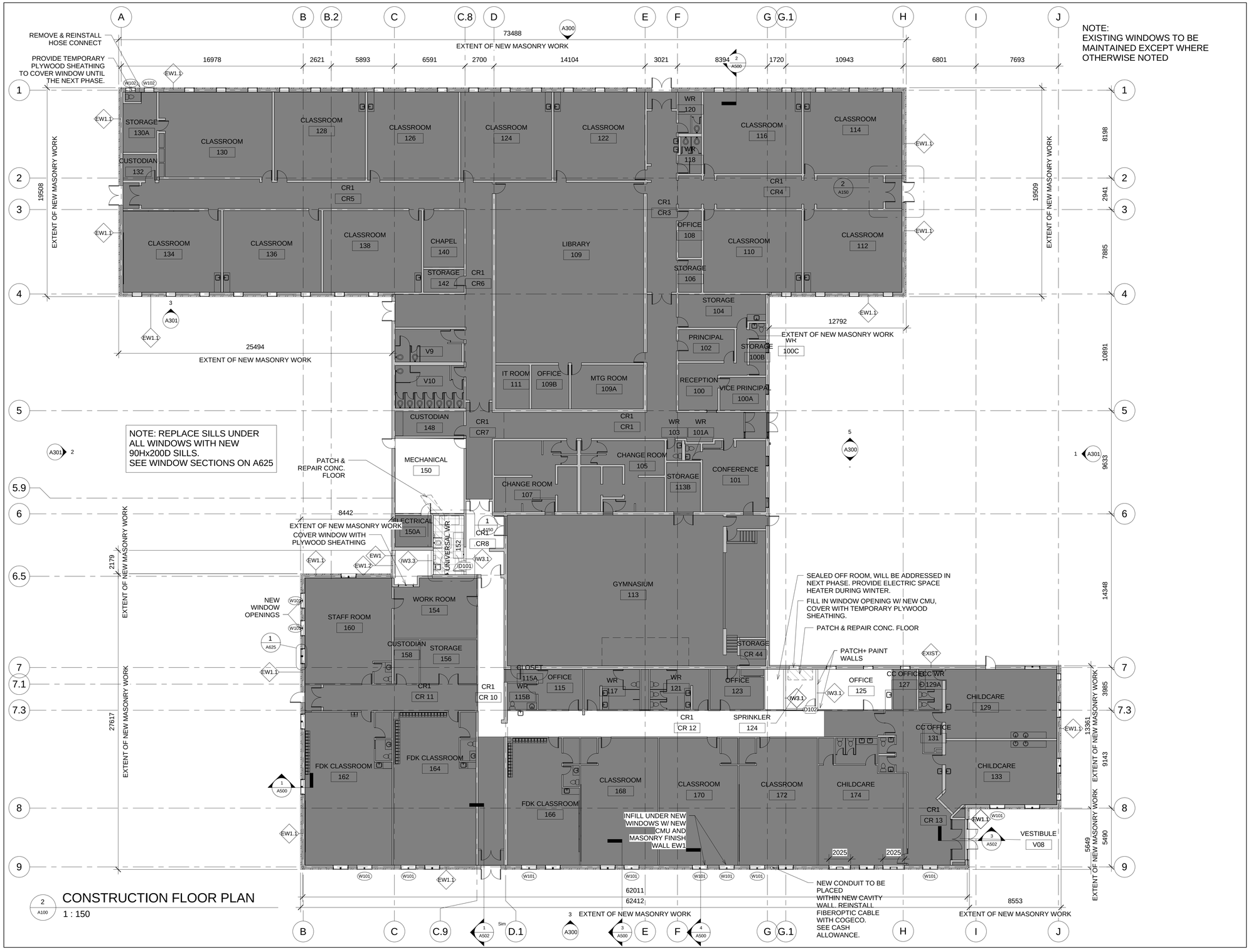
OUR LADY OF FATIMA PHASE 2 RENEWAL REDUCED SCOPE

DRAWING TITLE
DEMOLITION SECTIONS

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	AD400
SCALE: 1 : 20	CHECKED BY: RW	
PROJECT No.: 1724		



CONSTRUCTION FLOOR PLAN

2 / A100

1 : 150

NOTE:
EXISTING WINDOWS TO BE MAINTAINED EXCEPT WHERE OTHERWISE NOTED

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NOTES

LEGEND

PATTERN	DESCRIPTION
	AREA OF WORK N.I.C.
	NEW ACT CEILING
	T+G OAK SOFFIT FINISH
	NEW INTERIOR WALLS
	EXISTING WALLS TO REMAIN
	NEW EXTERIOR MASONRY WALL ASSEMBLY
	EXISTING CONC. BLOCK TO REMAIN

Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

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OUR LADY OF FATIMA PHASE 2
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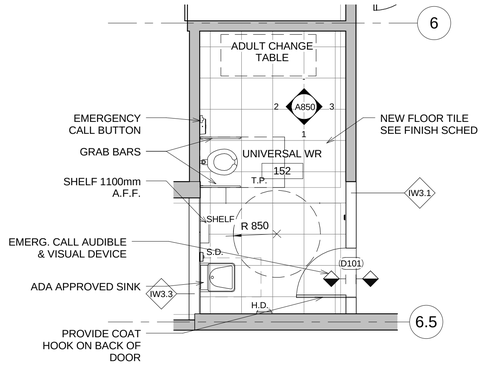
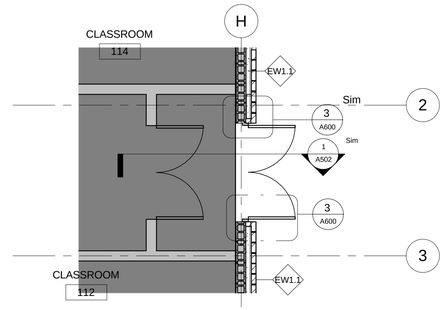
DRAWING TITLE
CONSTRUCTION FLOOR PLAN

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A100
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



1 / A150 UNIVERSAL WASHROOM PLAN

1 : 50



2 / A150 PLAN DETAIL @ VESTIBULE V2

1 : 50

NOTE:
PATCH, REPAIR AND PAINT ALL WALLS AFFECTED BY WORK.

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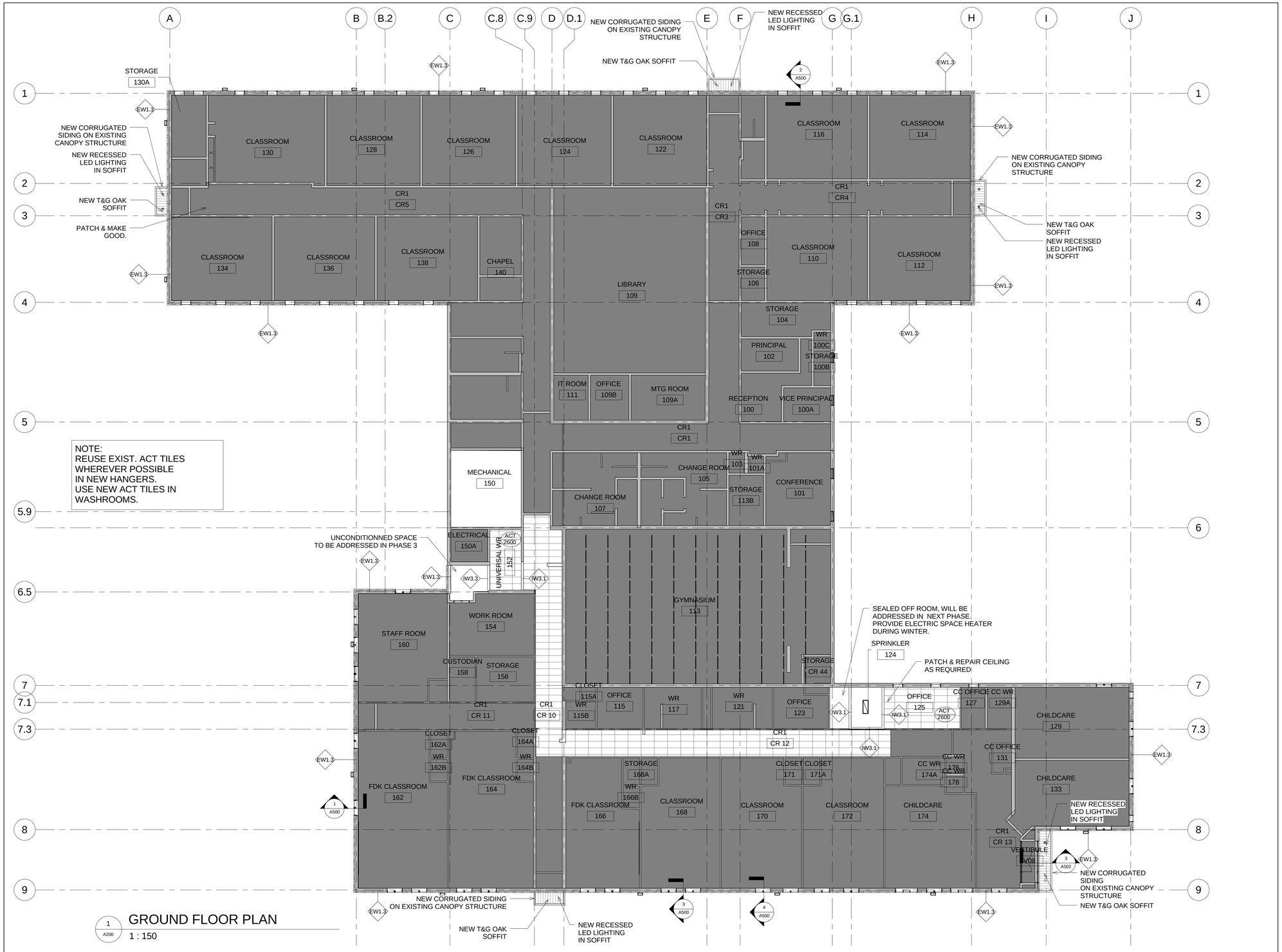
PROJECT TITLE
OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

DRAWING TITLE
ENLARGED FLOOR PLANS

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A150
SCALE: 1 : 50	CHECKED BY: RW	
PROJECT No.: 1724		



NOTE:
REUSE EXIST. ACT TILES WHEREVER POSSIBLE IN NEW HANGERS.
USE NEW ACT TILES IN WASHROOMS.

1 A200 GROUND FLOOR PLAN
1 : 150

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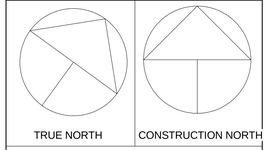

NOTES

LEGEND

PATTERN	DESCRIPTION
	AREA OF WORK N.I.C.
	NEW ACT CEILING
	T+G OAK SOFFIT FINISH
	NEW INTERIOR WALLS
	EXISTING WALLS TO REMAIN
	NEW EXTERIOR MASONRY WALL ASSEMBLY
	EXISTING CONC. BLOCK TO REMAIN

Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

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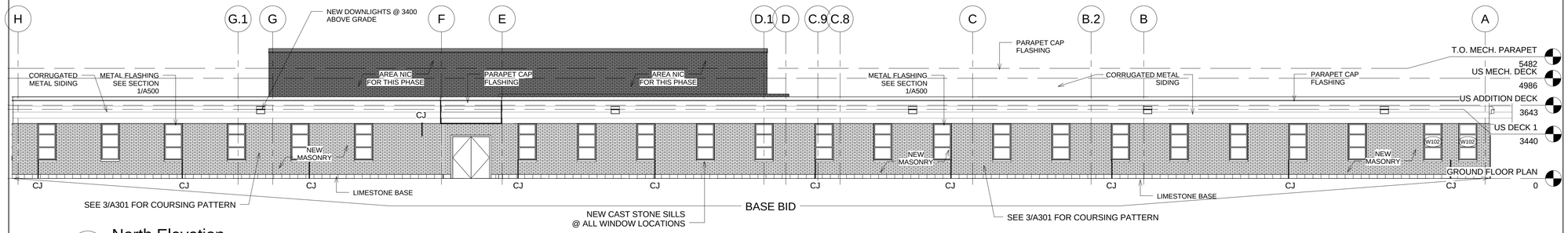
PROJECT TITLE
OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

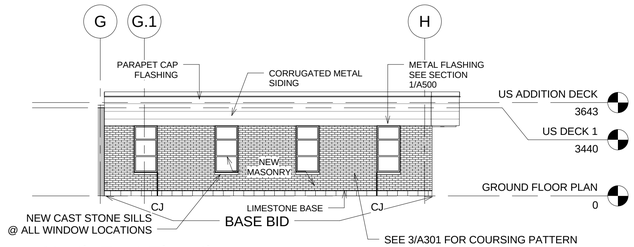
DRAWING TITLE
REFLECTED CEILING PLAN

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A200
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



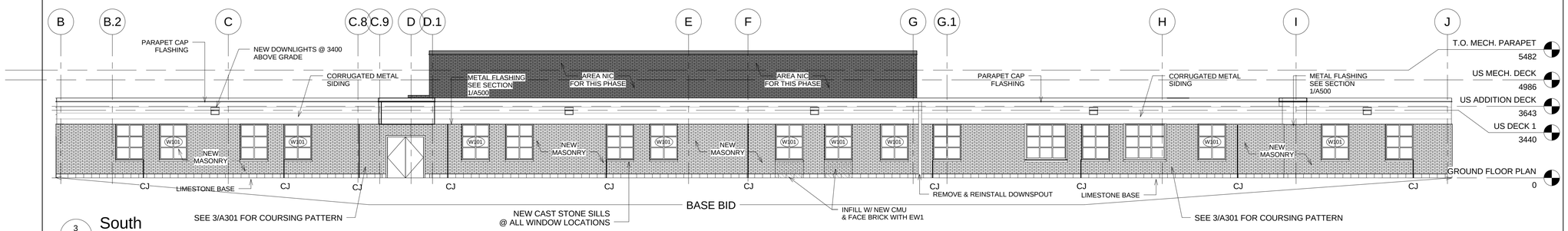
2 / A300 **North Elevation**

1 : 100



5 / A300 **North East Elevation**

1 : 100



3 / A300 **South**

1 : 100

NOTE:
CONTROL JOINTS TO ALIGN WHEREVER POSSIBLE WITH EXISTING CONTROL JOINTS IN CONCRETE BLOCK STRUCTURAL WALL BEHIND BRICK MASONRY.

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KEY PLAN

TRUE NORTH | CONSTRUCTION NORTH

NOTES

LEGEND

Date	Description	No.
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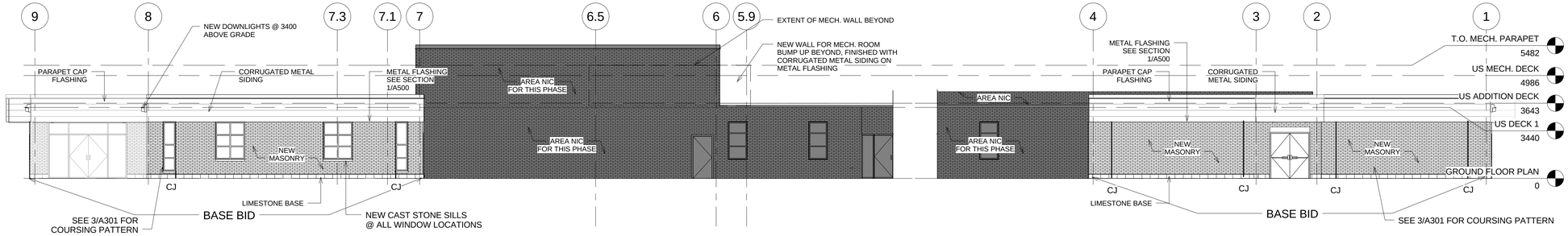
PROJECT TITLE
OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

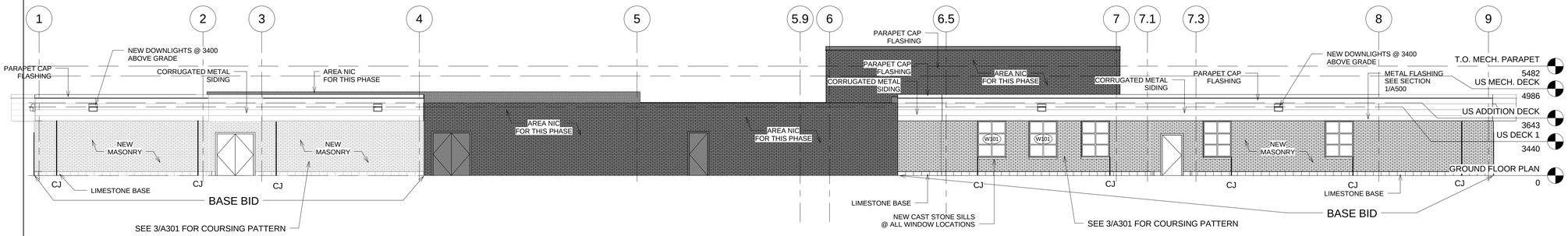
DRAWING TITLE
EXTERIOR ELEVATIONS

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A300
SCALE: 1 : 100	CHECKED BY: RW	
PROJECT No.: 1724		



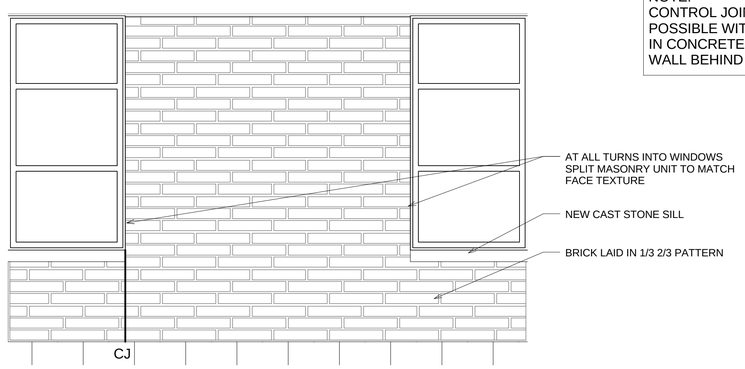
1 / A301 East Elevation

1 : 100



2 / A301 West

1 : 100



NOTE:
CONTROL JOINTS TO ALIGN WHEREVER POSSIBLE WITH EXISTING CONTROL JOINTS IN CONCRETE BLOCK STRUCTURAL WALL BEHIND BRICK MASONRY.

3 / A301 COARSING ELEVATION

1 : 20

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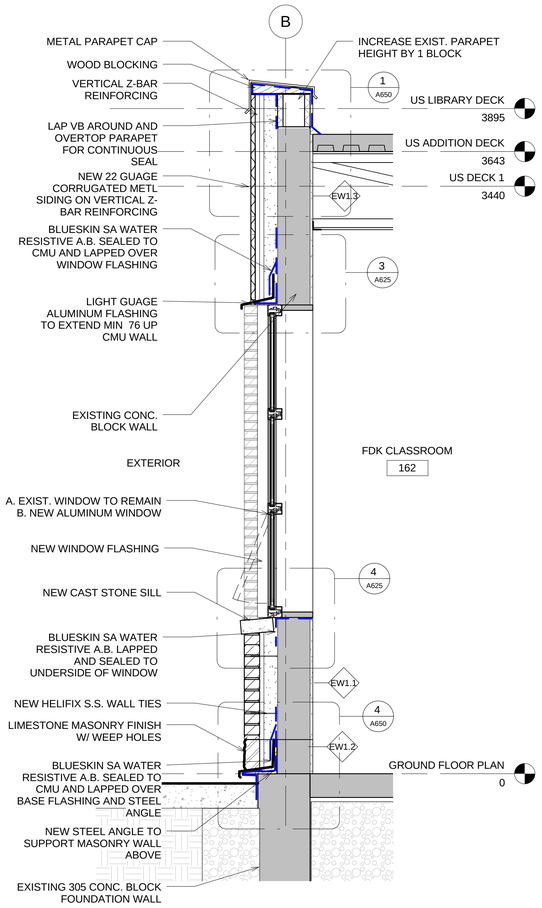
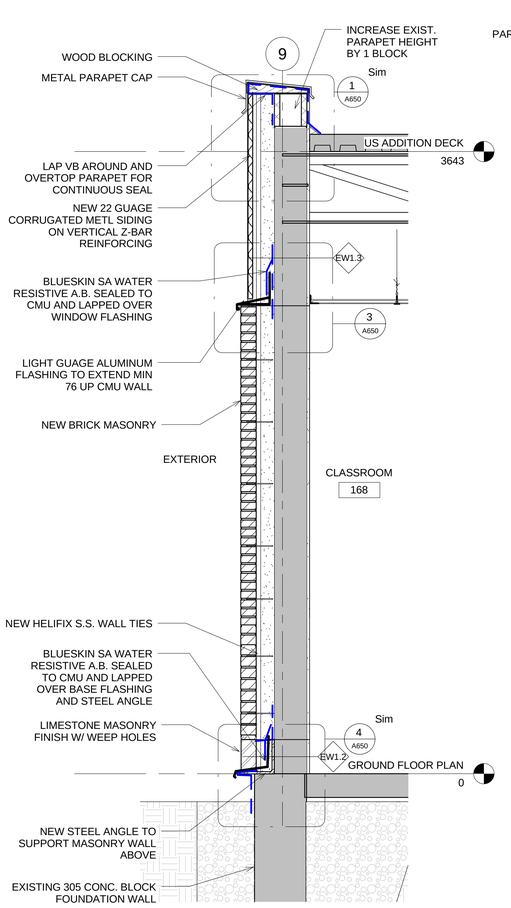
PROJECT TITLE
OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

DRAWING TITLE
EXTERIOR ELEVATIONS

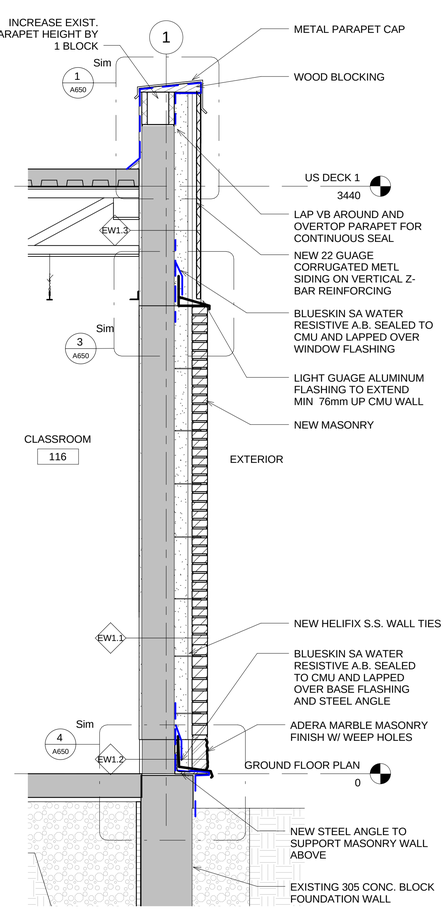
DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A301
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



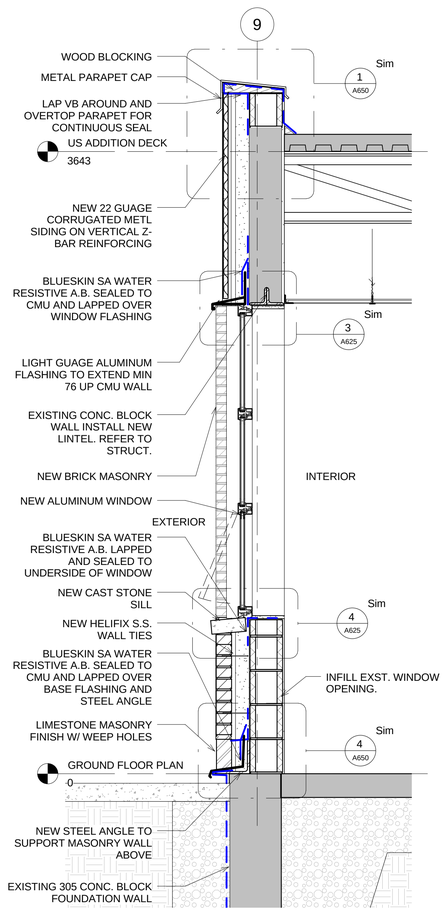
1 A500 TYP. WALL SECTION @ WINDOW
1 : 15



3 A500 TYP. WALL SECTION @ 1987 ADDITION
1 : 15



2 A500 TYP. WALL SECTION
1 : 15



4 A500 SECTION @ NEW WINDOW
1 : 15

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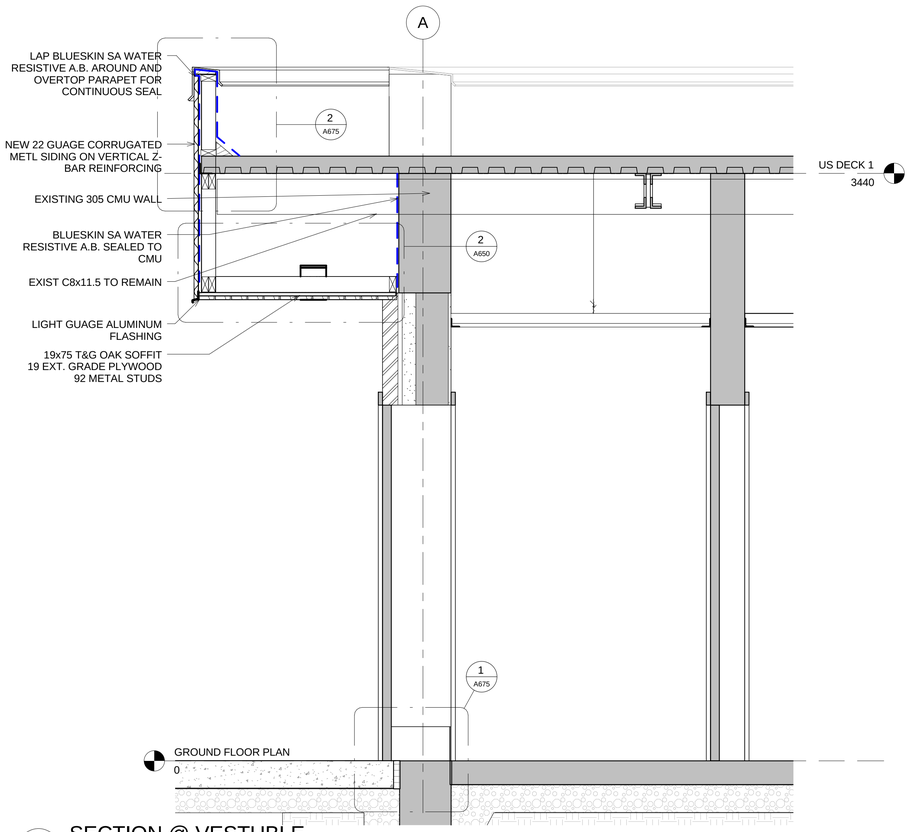
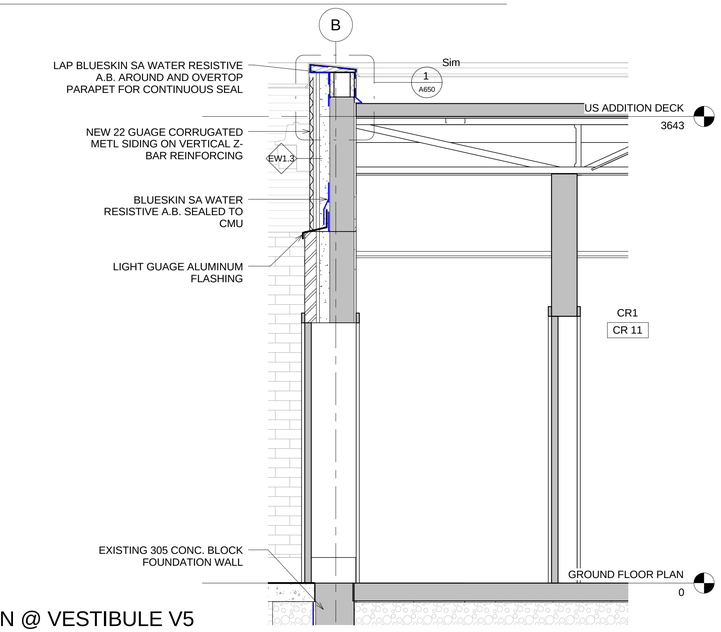
DRAWING TITLE
WALL SECTIONS

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A500
SCALE: 1 : 15	CHECKED BY: RW	
PROJECT No.: 1724		



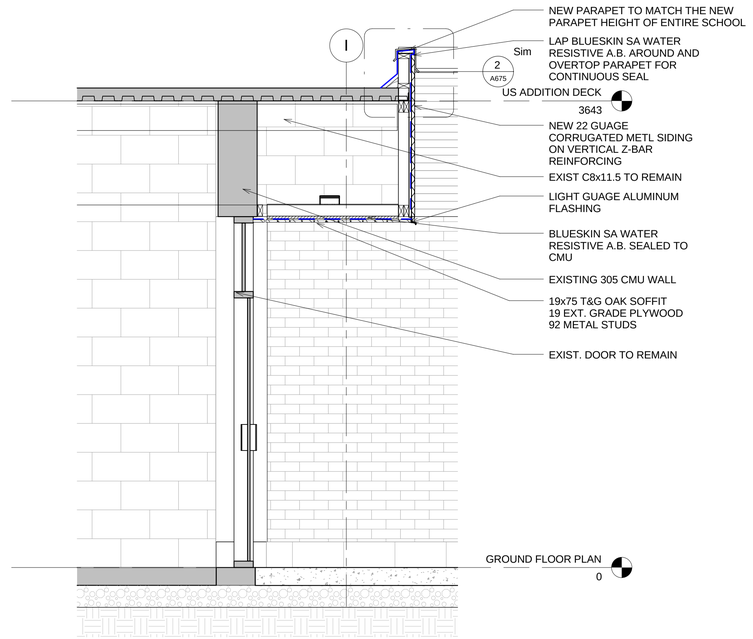
1 / A502 SECTION @ VESTUBLE

1 : 15



2 / A502 SECTION @ VESTIBULE V5

1 : 20



3 / A502 SECTION @ CHILDCARE ENTRANCE VESTIBULE

1 : 20

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LICENCE
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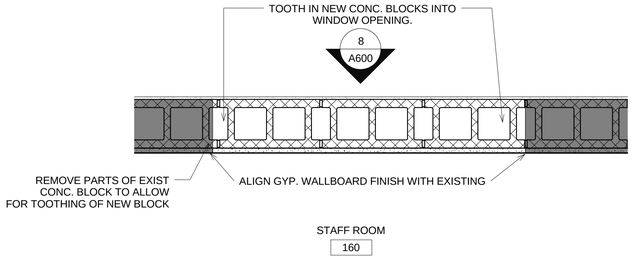
PROJECT TITLE

OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

DRAWING TITLE

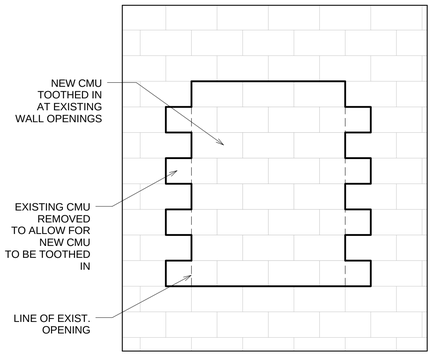
WALL SECTIONS

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A502
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



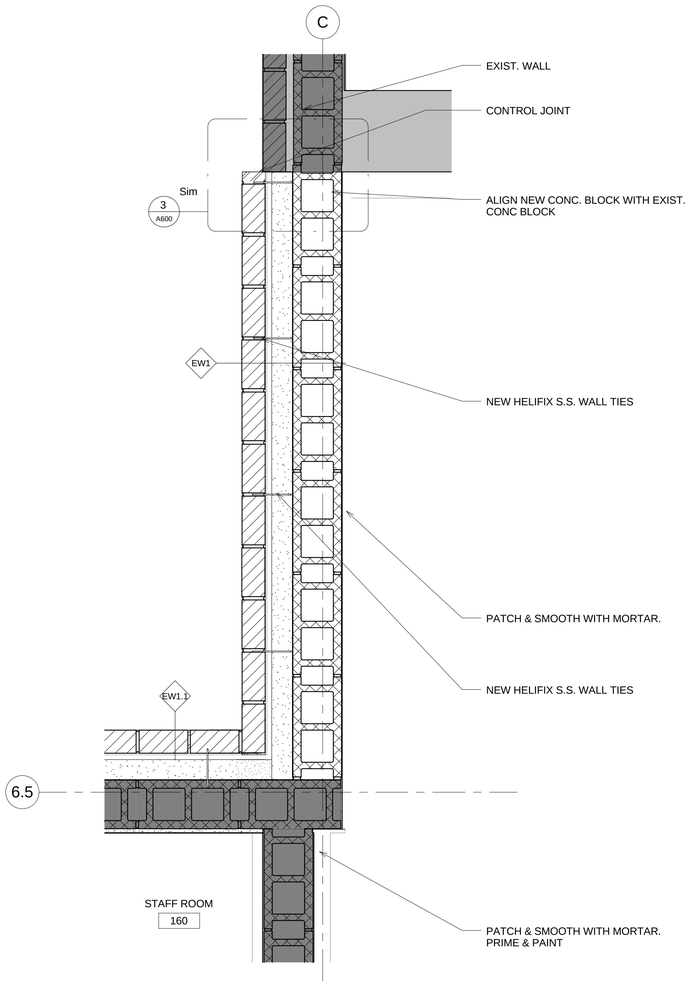
1 A600 DETAIL @ WALL INFILL

1 : 10



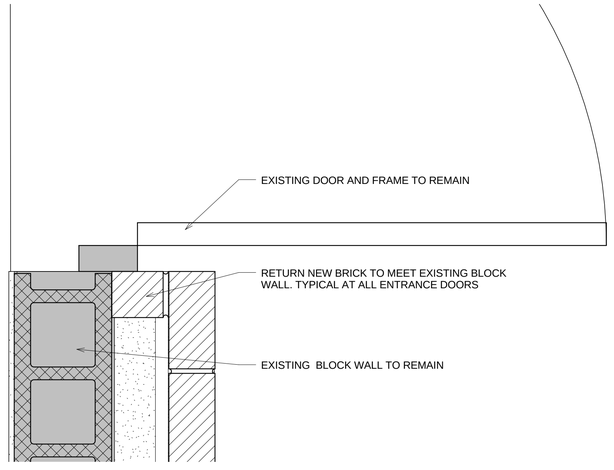
8 A600 WALL INFILL ELEVATION

1 : 20



2 A600 PLAN DETAIL @ LOUVREL CORNER

1 : 10



3 A600 TYPICAL PLAN DETAIL AT EXITING ENTRY DOORS

1 : 5

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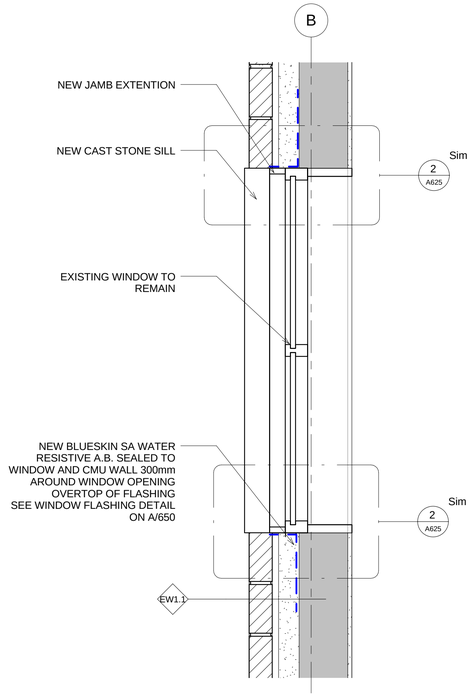
DRAWING TITLE

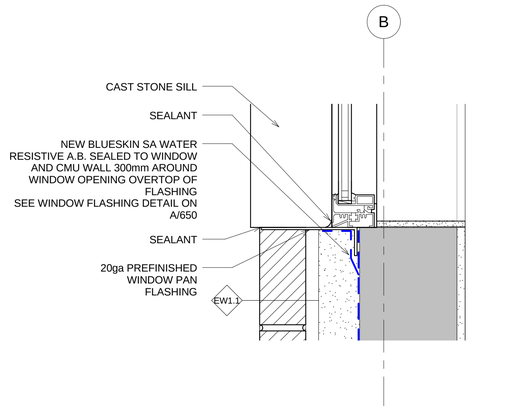
PLAN DETAILS

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A600
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



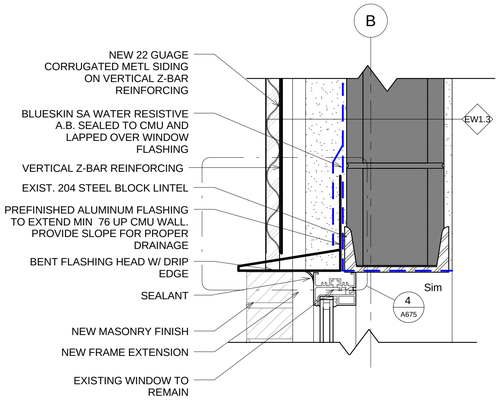
1 A625 PLAN DETAIL @ WINDOW JAMB

1 : 10



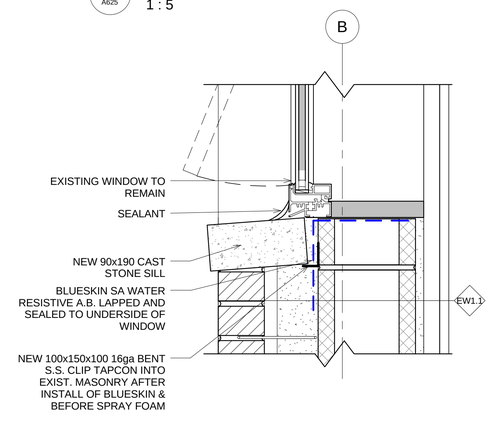
2 A625 DETAIL @ JAMB

1 : 5



3 A625 HEAD DETAIL

1 : 5



4 A625 SILL DETAIL

1 : 5

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KEY PLAN

TRUE NORTH | CONSTRUCTION NORTH

NOTES

LEGEND

Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

ONTARIO ASSOCIATION OF ARCHITECTS
RANDY R. WILSON
LICENCE
4000

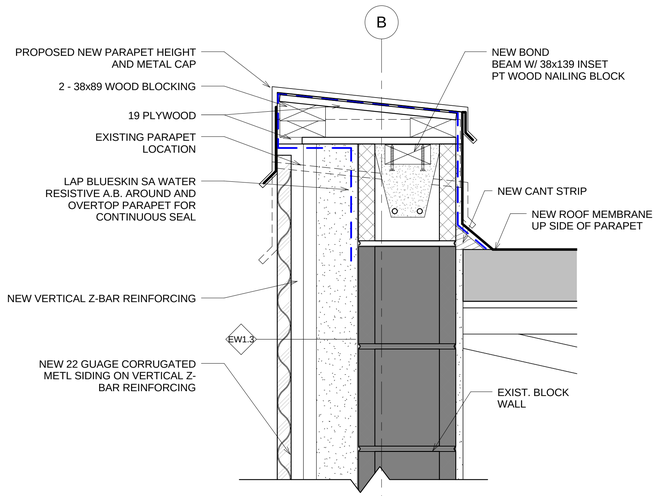
PROJECT TITLE

OUR LADY OF FATIMA PHASE 2 RENEWAL REDUCED SCOPE

DRAWING TITLE

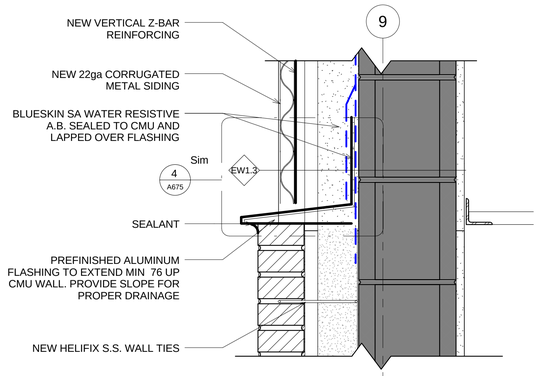
WINDOW DETAILS

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A625
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



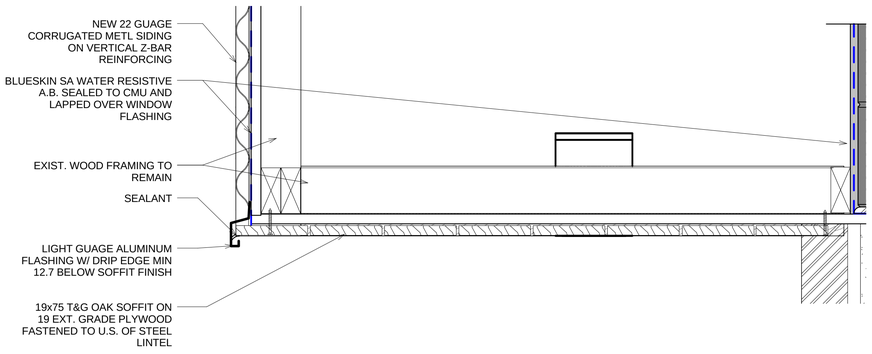
1 A650 TYP. PARAPET DETAIL

1 : 5



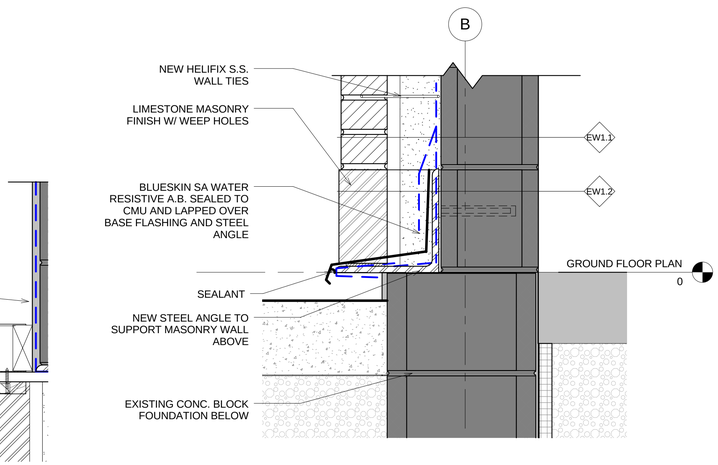
3 A650 TYP. SECTION @ FLASHING

1 : 5



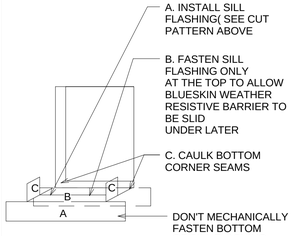
2 A650 SECTION @ VESTIBULE HEADER

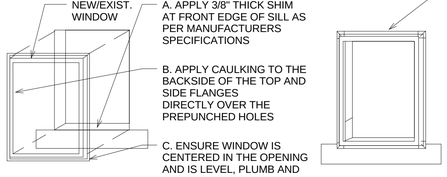
1 : 5

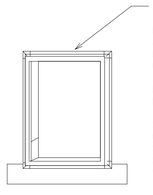


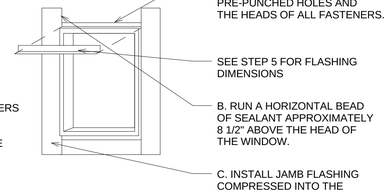
4 A650 TYP SECTION @ FOUNDATION

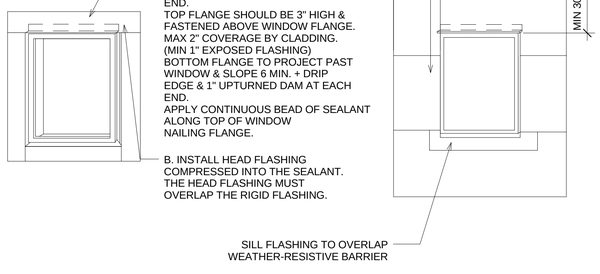
1 : 5











WINDOW FLASHING & WATERPROOFING DETAILS

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KEY PLAN

TRUE NORTH

CONSTRUCTION NORTH

NOTES

LEGEND

Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

ONTARIO ASSOCIATION OF ARCHITECTS
RANDY R. WILSON
LICENCE
4000

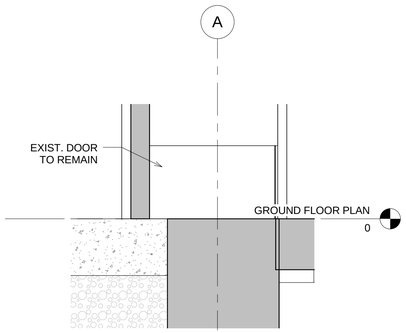
PROJECT TITLE

OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

DRAWING TITLE

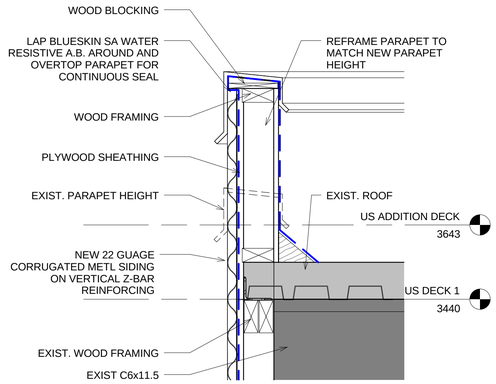
SECTION DETAILS

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A650
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



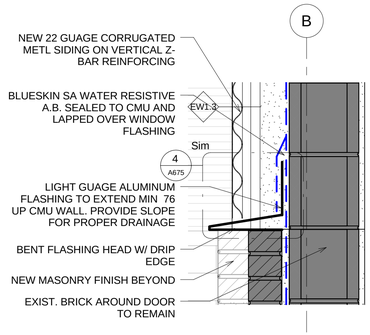
1 A675 DOOR THRESHOLD DETAIL

1 : 7



2 A675 SECTION @ CANOPY PARAPET

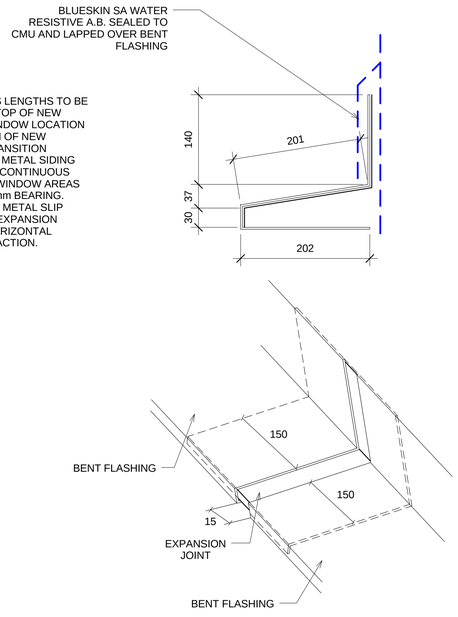
1 : 7



3 A675 SECTION @ VESTIBULE V5 SOFFIT

1 : 7

FABRICATE CONTINUOUS LENGTHS TO BE PLACED ALONG ENTIRE TOP OF NEW MASONRY AND OVER WINDOW LOCATION AROUND ENTIRE LENGTH OF NEW MASONRY WALL AS A TRANSITION BETWEEN CORRUGATED METAL SIDING AND MASONRY. ENSURE CONTINUOUS UNBROKEN SPAN OVER WINDOW AREAS WITH A MINIMUM OF 300mm BEARING. PROVIDE 300mm LENGTH METAL SLIP SECTION @ EACH 15mm EXPANSION JOINT TO ALLOW FOR HORIZONTAL EXPANSION AND CONTRACTION.



4 A675 BENT FLASHING HEAD DETAIL

1 : 4

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KEY PLAN

TRUE NORTH

CONSTRUCTION NORTH

NOTES

LEGEND

Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

ONTARIO ASSOCIATION OF ARCHITECTS
RANDY R. WILSON
LICENCE
4000

PROJECT TITLE
OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

DRAWING TITLE
SECTION DETAILS

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A675
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		

1 / A800

FINISHING PLAN

1 : 150

ROOM FINISH SCHEDULE — **WDAI - 1724**

Our Lady of Fatima - Chatham - Phase II — *CHANGES ARE HIGHLIGHTED, BOLD & ITALICIZED*

Wilson Diaz Architects Incorporated

Abbreviations

ACT	Acoustic Ceiling Tile	**EP.PT.**	Epoxy Paint	**GLZ**	Glazing	**OPEN**	Open to adjacent room	**SRTC**	Service Room Traffic Coating
Anod	Anodized Alum Frames	**EPF**	Epoxy Flooring	**GSW**	Glass System Wall	**PCT**	Porcelain Tile	**STO**	Stone
C/F	Clear Finish Struss	**EPW**	Epoxy Wall Coating	**GYP**	Gypsum Board	**PT**	Paint	**TER**	Terrazzo
CMU	Concrete Masonry Unit	**EX**	Existing	**HW**	Hardwood	**RES**	Resilient Sht. Flooring/Base	**QT**	Quartz Tile
COVE	Cove Base	**EXP**	Exposed Structure	**IP**	Intumescent Paint	**RUB**	Rubber Flooring/Base	**WB**	Wood base finish to match floor
CSH	Cushon Flooring	**GB**	Gypsum Board	**LIN**	Linoleum	**SB**	Stone Base	**WC**	Wallcovering (# indicates wallcovering type)
CT	Ceramic Tile	**GLB**	Glass Block	**N/A**	Not Applicable	**SPR**	Spartacote	**WD**	Woodwork

Room No.	Room Name	Floor Material	Floor Finish	Floor Base	North Mat'l	North Finish	East Mat'l	East Finish	South Mat'l	South Finish	West Mat'l	West Finish	Ceiling Mat'l	Ceiling Finish	Ceiling Height	Remarks
152	Universal Washroom	PCT		PCT	EX	PT	EX	PT	EX	PT	EX	PT	ACT	-	2600	Refer to elevations in A820 for ceramic tile finish
124	Sprinkler	EX	EX	RUB										-		
125	Office	EX	EX	EX	PT		PT		PT		PT		ACT	-	2600	

2 / A800

ROOM FINISH SCHEDULE

1 : 30

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KEY PLAN

TRUE NORTH

CONSTRUCTION NORTH

NOTES

LEGEND

	PATCH & REPAIR CONCRETE FLOOR WHERE AFFECTED BY PLUMBING WORK OR WALL REMOVAL.
	PCT - PORCELAIN TILE W/ PCT BASE - FIELD PATTERN
	PCT - PORCELAIN TILE W/ PCT BASE - HIGHLIGHT PATTERN
	QT - NEW QUARTZ TILE

Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

ONTARIO ASSOCIATION OF ARCHITECTS
RANDY R. WILSON
LICENCE
4000

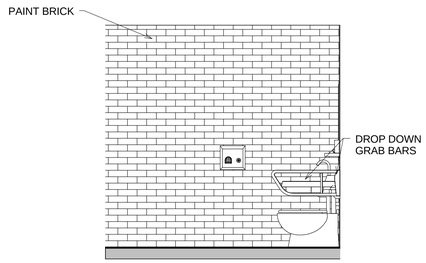
PROJECT TITLE

OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

DRAWING TITLE

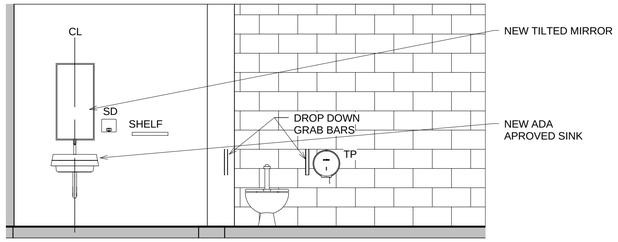
FINISHING PLAN

DATE: 5/15/2018	DRAWN BY: SH	DRAWING No.: A800
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



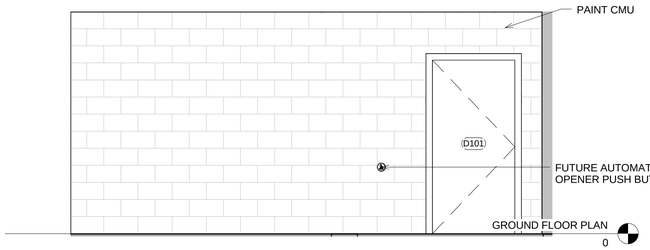
1 A850 UNIVERSAL WR ELEVATION D

1 : 30



2 A850 UNIVERSAL WR ELEVATION A

1 : 30



3 A850 UNIVERSAL WR ELEVATION C

1 : 30

NOTE:
PATCH, REPAIR AND
PAINT ALL WALLS

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KEY PLAN

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CONSTRUCTION NORTH

NOTES

LEGEND

Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

ONTARIO ASSOCIATION OF ARCHITECTS
RANDY R. WILSON
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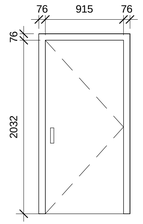
PROJECT TITLE
OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

DRAWING TITLE
INTERIOR ELEVATIONS

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A850
SCALE 1 : 30	CHECKED BY RW	
PROJECT No. 1724		

Door Schedule												
Mark	From Room	To Room	Construction Type	Width	Height	Type	Material	Finish	Glass	Frame Material	Frame Type	Comments
D101	152	CR8	SINGLE	965	2032	1	Hollow Metal	Paint	NO	HM	1	
D102	CR 12	124	SINGLE	915	2032	1	Hollow Metal	Paint	NO	HM	1	

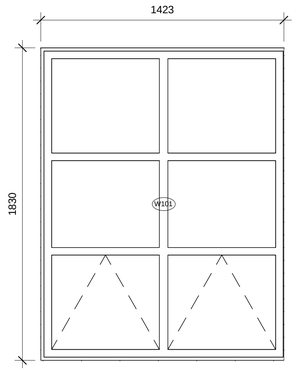


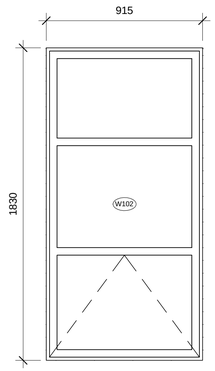
TYPE 1

NOTE:
G.C. TO SITE VERIFY ALL DOOR DIMENSIONS.

DOOR TYPES
1 : 30

EXTERIOR WINDOW ELEVATIONS:





NOTE:
G.C. TO SITE VERIFY ALL WINDOW DIMENSIONS.

NOTE:
NEW ROLLER WINDOW SHADES TO BE INSTALLED ON ALL CLASSROOM AND STAFF/OFFICE WINDOWS.

1 / A1000 W101 WINDOW ELEVATION
1 : 15

4 / A1000 W102 WINDOW ELEVATION
1 : 15

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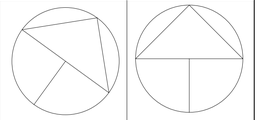
KEY PLAN



NOTES

LEGEND

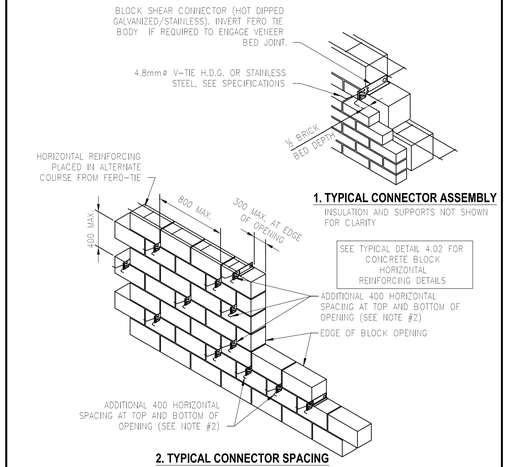
Date	Description	No.
5/18/2018	ISSUED FOR TENDER	1

ONTARIO ASSOCIATION OF ARCHITECTS
RANDY R. WILSON
LICENCE
4000

PROJECT TITLE
OUR LADY OF FATIMA PHASE 2
RENEWAL REDUCED SCOPE

DRAWING TITLE
SCHEDULES

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	A1000
SCALE: As indicated	CHECKED BY: RW	
PROJECT No.: 1724		



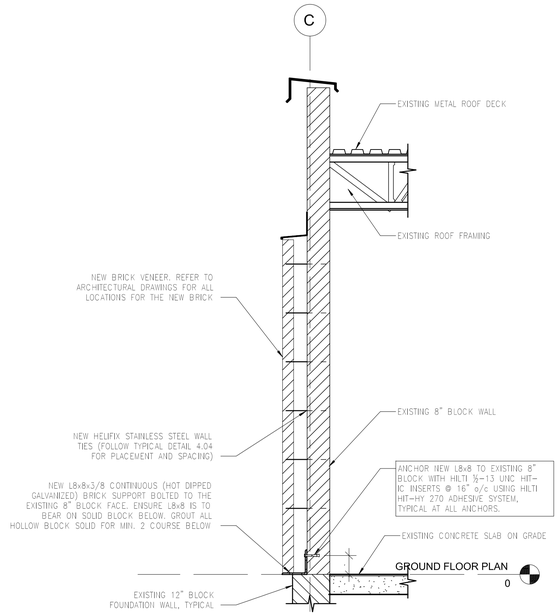
1. TYPICAL CONNECTOR ASSEMBLY
INSULATION AND SUPPORTS NOT SHOWN FOR CLARITY

2. TYPICAL CONNECTOR SPACING
INSULATION, BRICK, AND INSULATION SUPPORTS NOT SHOWN FOR CLARITY

NOTES:

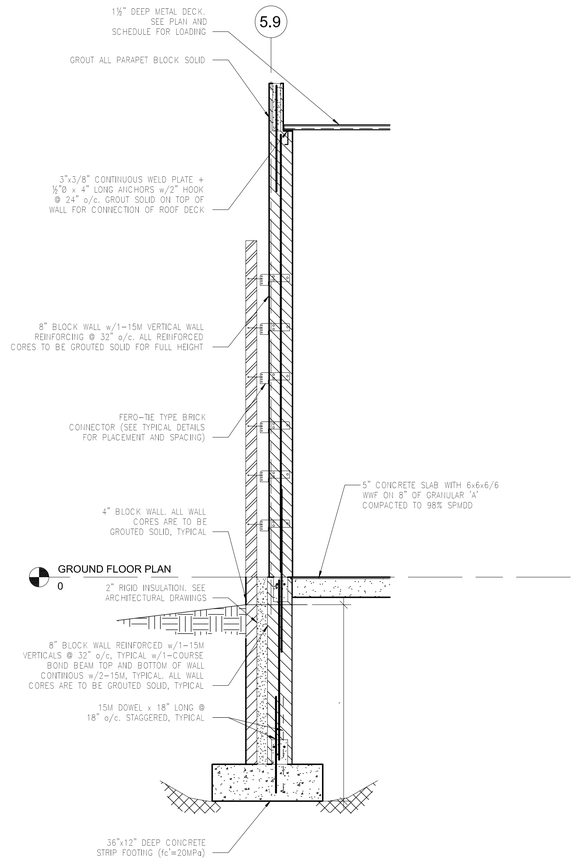
1. BRICK CONNECTORS SHALL BE 'FERO' BLOCK SHEAR CONNECTOR STYLE
2. CONNECTORS AND 'V' TIES ARE TO BE EITHER HOT DIPPED GALVANIZED OR STAINLESS STEEL, SEE SPECIFICATIONS.
3. SPACE CONNECTORS 400 o/c VERTICAL & 800 o/c HORIZONTAL. STAGGER CONNECTORS HORIZONTALLY. ALSO SPACE EXTRA CONNECTORS AT 400 o/c VERTICAL AND HORIZONTAL SPACING BESIDE, ABOVE AND BELOW ALL OPENINGS IN BLOCK WALLS.
4. SEE TYPICAL DETAIL 4.02 FOR EXTRA VENEER REINFORCING FOR STACK BOND MASONRY VENEERS

4.04 FERO BRICK TIE DETAILS



3 / S101 SECTION_ 1 : 20

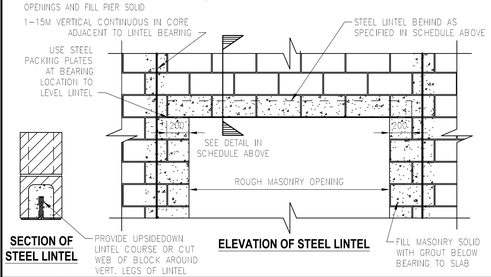
TYPICAL DETAIL FOR NEW BRICK VENEER PLACEMENT ON THE EXISTING BLOCK WALL



2 / S101 SECTION 1 : 20

WALL THICKNESS	CLEAR SPAN OF ROUGH MASONRY OPENING				DETAIL
	UP TO 1220	1221 to 1800	1801 to 2360	2361 to 3050	
90 BLOCK 90 VENEER	L90x90x6	L100x90x8	L125x90x8	L125x90x10	LLV
140 BLOCK	2-L65x65x6	2-L90x65x6	2-L90x65x8	2-L90x65x10	65 LEGS HORIZ.
190 BLOCK	2-L90x75x6	2-L90x90x6	2-L100x90x8	2-L125x90x10	90 LEGS HORIZ.
240 BLOCK	L100x75x6 + L125x75x6	L100x100x6 + L125x75x6	L100x100x8 + L125x90x8	L150x100x8 + L125x125x8	100 AND 125 LEGS HORIZ.
290 BLOCK	3-L90x75x6	3-L90x90x6	3-L100x90x8	3-L125x90x10	90 LEGS HORIZ.

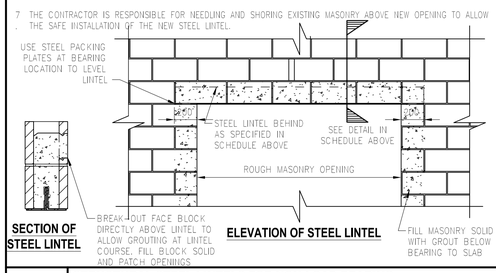
1. IT IS THE RESPONSIBILITY OF THE STRUCTURAL STEEL CONTRACTOR TO READ THIS SCHEDULE IN CONJUNCTION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS TO DETEMINE SIZE AND LOCATION OF LINTELS IN NON-LOAD BEARING WALLS. OPENINGS IN NON-LOAD BEARING WALLS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
2. WELD BACK TO BACK ANGLES AT 400 c/c ON TOP AND BOTTOM OF LINTEL. FIRST WELD TO BE 75 FROM ENDS OF ANGLES.
3. ALL EXTERIOR LINTELS SUPPORTING BRICK VENEER TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.
4. CONNECT ALL LINTELS TO COLUMNS WHEN THERE IS LESS THAN 300 BETWEEN EDGE OF ROUGH OPENING AND STEEL COLUMN FACE.
5. FILL BLOCKS AROUND STEEL LINTELS IN CONCRETE BLOCK WALLS SOLID WITH GROUT.
6. WHEN 600 OR LESS TO NEXT ROUGH OPENING, PLACE 2-15M VERTICAL IN CENTRE CORE OF PIER BETWEEN OPENINGS AND FILL PIER SOLID



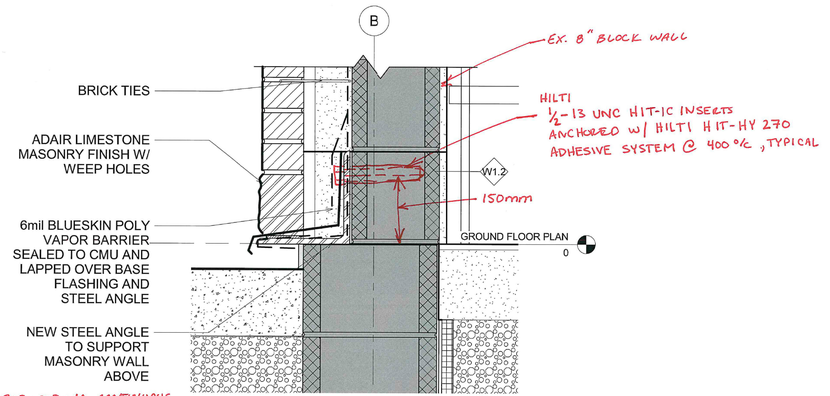
5.01 STRUCTURAL STEEL LINTELS FOR NON-LOAD BEARING CONCRETE BLOCK WALLS AND BRICK VENEER

WALL THICKNESS	CLEAR SPAN OF ROUGH MASONRY OPENING				DETAIL
	UP TO 1220	1221 to 1800	1801 to 2360	2361 to 3050	
90 BLOCK 90 VENEER	L90x90x6	L100x90x8	L125x90x8	L125x90x10	LLV
140 BLOCK	2-L65x65x6	2-L90x65x6	2-L90x65x8	2-L90x65x10	65 LEGS HORIZ.
190 BLOCK	2-L90x75x6	2-L90x90x6	2-L100x90x8	2-L125x90x10	90 LEGS HORIZ.
240 BLOCK	L100x75x6 + L125x75x6	L100x100x6 + L125x75x6	L100x100x8 + L125x90x8	L150x100x8 + L125x125x8	100 AND 125 LEGS HORIZ.
290 BLOCK	3-L90x75x6	3-L90x90x6	3-L100x90x8	3-L125x90x10	90 LEGS HORIZ.

1. IT IS THE RESPONSIBILITY OF THE STRUCTURAL STEEL CONTRACTOR TO READ THIS SCHEDULE IN CONJUNCTION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS TO DETEMINE SIZE AND LOCATION OF LINTELS IN NON-LOAD BEARING WALLS. OPENINGS IN NON-LOAD BEARING WALLS ARE NOT SHOWN ON STRUCTURAL DRAWINGS.
2. WELD BACK TO BACK ANGLES AT 400 c/c ON TOP AND BOTTOM OF LINTEL. FIRST WELD TO BE 75 FROM ENDS OF ANGLES.
3. ALL EXTERIOR LINTELS SUPPORTING BRICK VENEER TO BE HOT DIPPED GALVANIZED AFTER FABRICATION.
4. CONNECT ALL LINTELS TO COLUMNS WHEN THERE IS LESS THAN 300 BETWEEN EDGE OF ROUGH OPENING AND STEEL COLUMN FACE.
5. FILL BLOCKS AROUND STEEL LINTELS IN CONCRETE BLOCK WALLS SOLID WITH GROUT.
6. WHEN 24" OR LESS TO NEXT OPENING – PLACE 2-15M VERTICAL IN CENTRE CORE OF PIER BETWEEN OPENINGS AND FILL PIER SOLID.
7. THE CONTRACTOR IS RESPONSIBLE FOR NEEDLING AND SHORING EXISTING MASONRY ABOVE NEW OPENING TO ALLOW THE SAFE INSTALLATION OF THE NEW STEEL LINTEL.



5.01b STRUCTURAL STEEL LINTELS FOR NON-LOAD BEARING CONCRETE BLOCK WALLS AND BRICK VENEER



1 / S101 NEW BRICK SUPPORT 1 : 5

WILSON DIAZ ARCHITECTS INCORPORATED
280 QUEENS AVENUE, SUITE 1Q
LONDON, ONTARIO N6B 1X3
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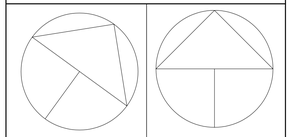
VB&S STRUCTURAL ENGINEERS

2017 AWARD OF EXCELLENCE CANADIAN CONSULTING ENGINEERING AWARDS

KEY PLAN



NOTES

LEGEND

Date	Description	No.
4/17/2018	ISSUED FOR TENDER	1

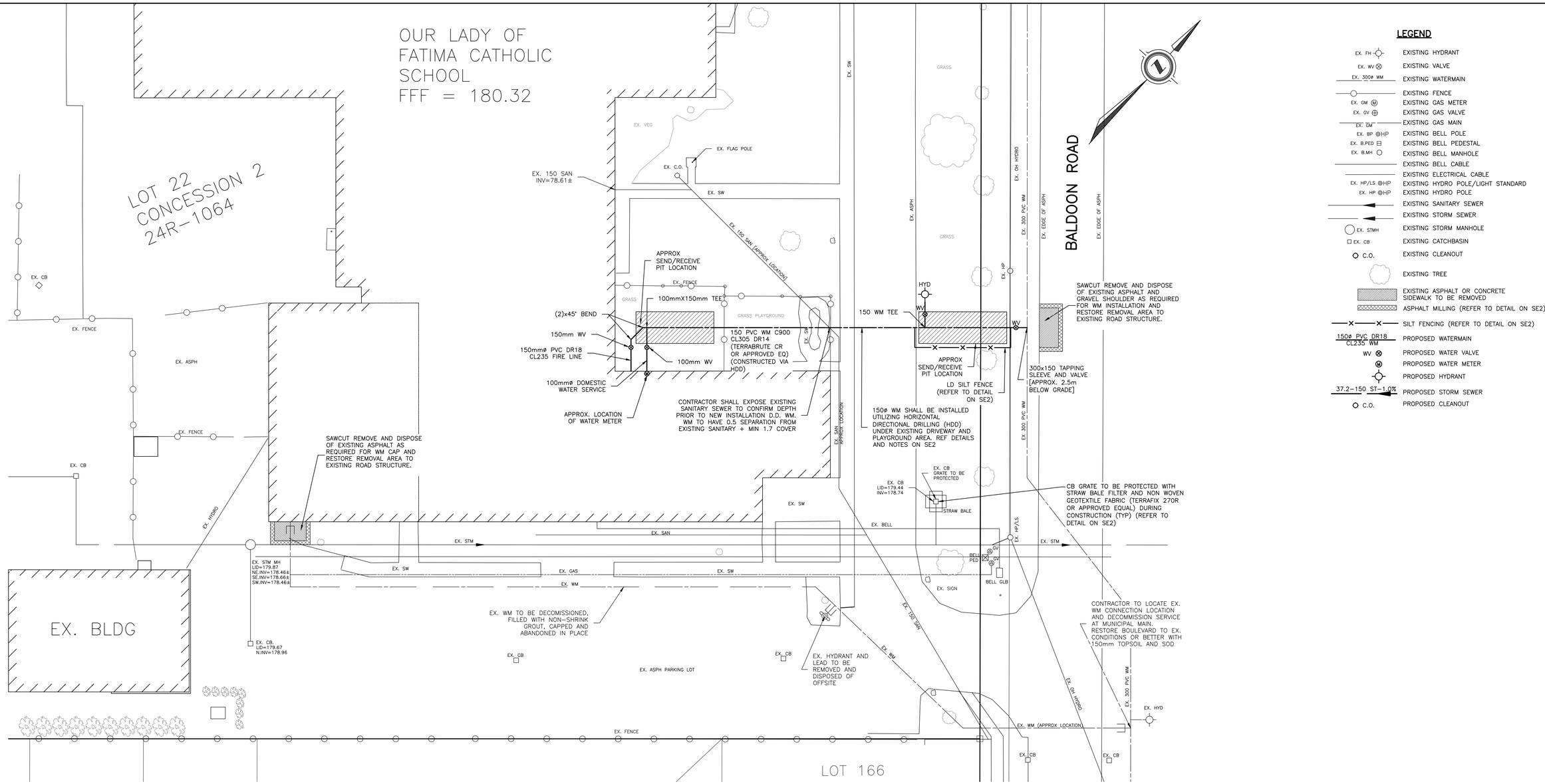
LICENSED PROFESSIONAL ENGINEER B. C. STOTT 100145784 April 26,2018 PROVINCE OF ONTARIO

ONTARIO ASSOCIATION OF ARCHITECTS RANDY R. WILSON LICENCE 4000

PROJECT TITLE
OUR LADY OF FATIMA PHASE 2 RENEWAL REDUCED SCOPE

DRAWING TITLE
STRUCTURAL

DATE	DRAWN BY	DRAWING No.
5/15/2018	SH	S101
SCALE 1724	CHECKED BY RW	
PROJECT No.		



LEGEND

- EX. FH — EXISTING HYDRANT
- EX. WV — EXISTING VALVE
- EX. 300ø WM — EXISTING WATERMAIN
- EXISTING FENCE
- EX. GM — EXISTING GAS METER
- EX. GV — EXISTING GAS VALVE
- EX. GM — EXISTING GAS MAIN
- EX. BP @HP — EXISTING BELL POLE
- EX. B.PED — EXISTING BELL PEDESTAL
- EX. B.MH — EXISTING BELL MANHOLE
- EXISTING BELL CABLE
- EXISTING ELECTRICAL CABLE
- EX. HP/LS @HP — EXISTING HYDRO POLE/LIGHT STANDARD
- EX. HP @HP — EXISTING HYDRO POLE
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EX. STMH — EXISTING STORM MANHOLE
- EX. CB — EXISTING CATCHBASIN
- C.O. — EXISTING CLEANOUT
- EXISTING TREE
- EXISTING ASPHALT OR CONCRETE SIDEWALK TO BE REMOVED
- ASPHALT MILLING (REFER TO DETAIL ON SE2)
- SILT FENCING (REFER TO DETAIL ON SE2)
- 150ø PVC DR18 CL235 WM — PROPOSED WATERMAIN
- WV — PROPOSED WATER VALVE
- M — PROPOSED WATER METER
- PROPOSED HYDRANT
- 37.2-150 ST-1.0% — PROPOSED STORM SEWER
- C.O. — PROPOSED CLEANOUT

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	No.	REVISIONS	DATE	CONSULTANT
DESIGN BY JSC/DH	1	ISSUED FOR TENDER/APPROVAL	03/21/18	DEVENG
DRAWN BY JSC	2	ADDED BUILDING ADDITION STM DRAIN	04/12/18	DEVENG
CHECKED BY DH	3	ISSUED FOR TENDER – WM ONLY	05/17/18	DEVENG
FILE: DEL18-011-C3D-BASE.DWG				

CONSULTANT OR DIVISION

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41 Adelaide St. N., Unit 71
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Paris Office
31 Mechanic St., Unit 301
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development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
J. R. SMITH
100144789
PROVINCE OF ONTARIO
May 16/18

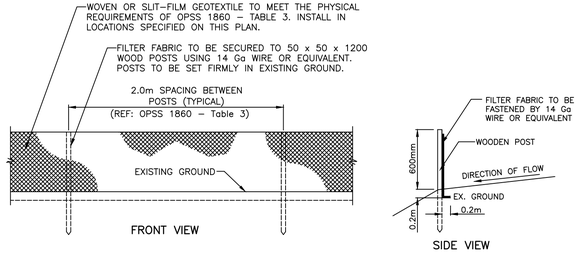
SCALE
SCALE – 1:250
2.5 0 5m

OUR LADY OF FATIMA CATHOLIC SCHOOL
515 BALDOON ROAD
CHATHAM, ONTARIO

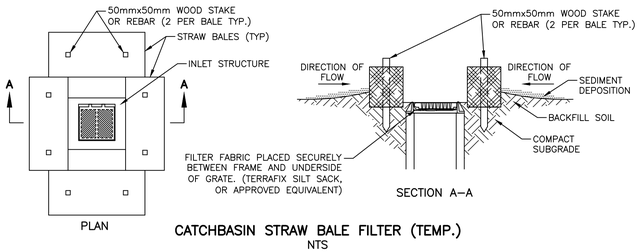
SITE SERVICING AND GRADING PLAN

PROJECT No. DEL18-011
SHEET No. SE1
PLAN FILE No.

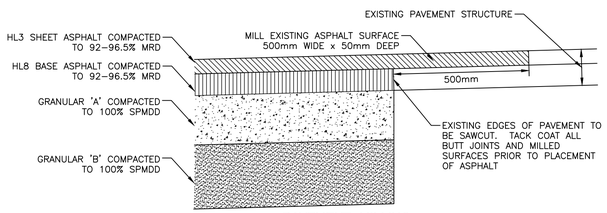
jaclair May.16/18-2:07pm DEL18-011-C3D-BASE.dwg



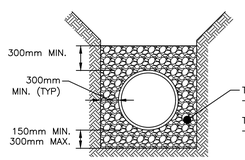
LIGHT-DUTY SILT FENCE
(REF: OPSD 219.11)
NTS



CATCHBASIN STRAW BALE FILTER (TEMP.)
NTS



PAVEMENT MILLING
N.T.S.



FLEXIBLE PIPE

NOTES:
- PROPERLY CONSOLIDATED AND COMPACTED 19mm CRUSHED STONE BEDDING TO BE EXCLUSIVELY UTILIZED AS BEDDING MATERIAL WITHIN 5.0m OF ALL MANHOLES.
- FOR SERVICES BEDDED IN LOOSE, WET OR DILATANT SILTY/SANDY SUBSOILS, CRUSHED STONE BEDDING TO BE WRAPPED IN A GEOTEXTILE (TERRAFIX 270R OR APPROVED EQUIVALENT WITH MIN. 0.45m OVERLAP) AS DIRECTED BY THE GEOTECHNICAL ENGINEER.

BEDDING STANDARD FOR GRAVITY AND PRESSURE PIPE
NTS

GENERAL CONSTRUCTION NOTES

1. All existing underground utilities, either shown or not shown, are to be located and marked prior to commencing construction within the site and on existing abutting road allowance. Any utilities damaged or disturbed during construction shall be repaired or replaced to the satisfaction of the governing body at the sole expense of the Owner's Contractor.
2. The Owner's Contractor is to meet all the requirements of the owners of the utilities on this plan, and must make satisfactory arrangements with the utility companies for crossing their installations and for providing adequate protection during construction. All existing underground plant (ie. telephone duct, gas mains, sewer, watermains) that will be crossed under during the installation of services for this development shall be supported by a support beam or by other methods as may be required by the Owners of the plant being crossed under. All temporary support measures required during the construction phase shall be the responsibility of the Owner's Contractor and independent engineering review/certifications shall be undertaken where necessary at no extra cost to the contract.
3. All existing boulevards and road surfaces disturbed during construction shall be restored to a condition at least as good as original (pre-construction condition), all to the satisfaction of the Municipal Engineer.
4. Prior to commencing ANY construction, the Owner's Contractor must verify all outlet information, benchmarks, elevations and dimensions and report any discrepancies immediately to the Engineer.
5. Prior to commencing any work on the installation of services, an approved set of plans must be available on the job site and shall remain there until work is completed.
6. The Owner's Contractor is responsible for the control of surface and subsurface water.
7. The Developer's Consulting Engineer shall provide full-time inspection and a Certificate of Compliance upon completion for all works to be constructed on existing Municipal streets.
8. The Developer shall have its Professional Engineer provide adequate inspection during construction on the site and a Certificate of Completion of works upon completion of all works which are to be assumed by the owner.
9. The Owner's Contractor shall take all necessary precautions to prevent the spilling or dumping of hazardous materials while fueling and maintaining vehicles and equipment.
10. If in the opinion of the Engineer a zone is contaminated through neglect and/or deliberate mishandling of toxic materials by the Owner's Contractor, the Owner's Contractor shall at no expense to the Owner excavate and dispose of all contaminated materials to an approved disposal site and provide soil remediation.
11. At least 48 hours prior to commencing construction on any existing road allowance maintained by the Municipality of Chatham/Kent, the Owner's Contractor is to obtain the appropriate work approval permit from the Municipality of Chatham/Kent Engineering Department.
12. The Owner's Contractor is responsible for notifying the Municipality of Chatham/Kent for all building inspection requirements and keep them informed as to their schedule.\
13. Existing servicing and topographic information was obtained by Hook & Todgham Surveying Incorporated, dated January 24, 2017 and by Development Engineering (London) Limited, dated _____.
14. For geotechnical information and recommendations respecting construction, refer to geotechnical report prepared by _____, dated _____, Report No. _____.
15. For complete building information and architectural details, refer to drawings by WILSON DIAZ ARCHITECTS INC.
16. For complete mechanical/electrical plan details, refer to drawings by CHORLEY AND BISSET.

CONSTRUCTION NOTES FOR THE SERVICING CONTRACTOR

1. The Contractor shall take precautions to avoid damage to existing servicing and surfaces not designated for removal. Any damage shall be repaired and restoration completed at the expense of the Owner's Contractor.
2. Prior to initiating site works, the Owner's Contractor shall obtain locates for all existing underground utilities within the area of construction. The Owner's Contractor shall be responsible for the cost of repair or replacement of any utilities damaged or disturbed during construction, and shall immediately contact the appropriate utility owner upon such occurrence.
3. Where utility crossings are required, the Owner's Contractor shall undertake appropriate measures for the temporary support of such utilities in accordance with the requirements of the utility owner until such time as backfilling and compaction are complete.
4. Prior to construction, an approved set of plans and specifications shall be available on the job site and shall remain on-site for the duration of construction. The Owner's Contractor shall verify with the Contract Administrator that the most current drawings are in circulation.
5. The Owner's Contractor shall be responsible for protection of all survey markers and monuments during construction. Any legal survey monuments which are disturbed during construction shall be replaced at the expense of the Owner's Contractor.
6. All works shall be undertaken in accordance with current Occupational Health and Safety Act requirements.
7. Prior to undertaking on-site earth works, the Owner's Contractor shall install all sediment controls relevant to the area of site disturbance.
8. The Owner's Contractor shall be responsible for regular monitoring and cleanup of tracked mud/debris on adjacent lands and public roads to the satisfaction of the Engineer and Municipality.
9. The Owner's Contractor shall take all reasonable measures to avoid mixing topsoil with subsoil where required for reuse on-site.
10. On-site surface drainage shall be maintained by the Owner's Contractor at all times. Erosion and sediment controls shall be applied where necessary to prevent uncontrolled release of sediment off-site. Where excavation dewatering is necessary, pump discharge shall be directed to stable, vegetated areas or dedicated sediment traps (OPSD 219.24) to the satisfaction of the Engineer.
11. The Owner's Contractor shall maintain an operations log of erosion & sediment control structure inspections throughout the project, with particular emphasis on control measures after rainfall events of 12mm or greater. Periodic removal of accumulated sediment shall be undertaken as necessary or at the expressed direction of the Engineer. All collected sediment shall be disposed of at an approved location at no extra cost to the contract.
12. Unless otherwise noted on the plans, geotextile for erosion control measures shall be non-woven to meet class 1-OPSS 1860.07.02 (i.e. Terrafix 270R, or approved equivalent) with 300mm min. overlaps.
13. Topsoil windrows shall be constructed separately from subsoil stockpiles, and shall be located no closer than two (2) metres from any adjacent property boundary. Windrow Slopes shall generally be flatter than 3:1 (horizontal to vertical) and should generally not exceed 6 metres in height.
14. Temporary interceptor swales to be 600mm wide (min.) with 3:1 side slopes, and maintained until site pregrade is stabilized with temporary vegetation to the satisfaction of the engineer.
15. Sediment controls shall be implemented by the Owner's Contractor in localized areas, as warranted, during construction phases, upon the direction of the engineer. Control approaches should be adaptable to reflect variable site conditions and circumstances.
16. The Owner's Contractor shall prevent wind blown dust by periodic application of water.
17. All substitutions are subject to approval by the Engineer.

EXACT LIMITS OF EXCAVATION MAY VARY DEPENDENT UPON CONTRACTOR'S CHOSEN CONSTRUCTION METHODS AND CONDITIONS ENCOUNTERED IN THE FIELD. THE CONTRACTOR IS RESPONSIBLE FOR FOR RESTORING ALL SURFACES DISTURBED DURING CONSTRUCTION (CURB, SIDEWALK, PAVEMENT, LANDSCAPING, ETC.) TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.

AN ENGINEER-CERTIFIED DESIGN SUBMITTAL TO THE CONTRACT ADMINISTRATOR SHALL BE REQUIRED 14 DAYS (MIN) PRIOR TO UTILIZING TRENCHLESS TECHNOLOGY.

PRIOR TO CONSTRUCTION THE OWNER'S CONTRACTOR SHALL OBTAIN LOCATES FOR, EXPOSE AND CONFIRM LOCATION AND ELEVATION OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMIT OF CONSTRUCTION. THE OWNER'S CONTRACTOR SHALL SUPPORT EXISTING UNDERGROUND UTILITIES AS REQUIRED.

THE OWNERS CONSULTING ENGINEER IS REQUIRED TO INSPECT THE INSTALLATION OF SERVICES INCLUDED IN THIS PROJECT, IN ACCORDANCE WITH THE GENERAL REVIEW COMMITMENT CERTIFICATION PROCESS. THE OWNER'S CONTRACTOR IS TO ADVISE DEVELOPMENT ENGINEERING (LONDON) LTD. (519-672-8310) AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION ON THE SITE SERVICES.

TOPOGRAPHICAL INFORMATION AND SITE BENCHMARK AS PROVIDED HOOK & TODGHAM SURVERYING INC. (JAN. 24, 2017). DEVELOPMENT ENGINEERING (LONDON) LIMITED ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE SURVEY.

GENERAL NOTES:

1. NOT ALL UTILITIES MAY BE SHOWN. CONTRACTOR SHALL OBTAIN LOCATES FOR, EXPOSE AND CONFIRM LOCATION AND ELEVATION OF ALL EXISTING SERVICES AND UTILITIES PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL SUPPORT EXISTING UNDERGROUND UTILITIES AS REQUIRED DURING CONSTRUCTION
3. SEWER INSTALLATION METHODS SHALL BE AT THE CONTRACTOR'S DISCRETION AND MAY INCLUDE THE USE OF TRENCH LINERS WHERE REQUIRED TO MINIMIZE DISRUPTION TO EXISTING SEWERS/UTILITIES AND SURFACE FEATURES. PROTECTION AGAINST SLOPE STABILITY SHALL BE CONSIDERED AS REFERENCED IN THE GEOTECHNICAL REPORT.
4. THE CONTRACTOR SHALL KEEP THE EXISTING STORM AND SANITARY SEWERS LIVE DURING CONSTRUCTION OF PROPOSED SERVICES. STORM/SANITARY FLOWS MAY NEED TO BE TEMPORARILY CONTROLLED AND PUMPED FROM THE SEWER SYSTEM TO A DOWNSTREAM MANHOLE TO FACILITATE CONSTRUCTION OF THE PROPOSED SEWERS. ANY SUCH TEMPORARY MEASURES SHALL BE CONDUCTED AT NO EXTRA COST TO THE CONTRACT AND BE BASED UPON THE CONTRACTOR'S WORK PLAN, WHICH SHALL BE SUBMITTED TO THE CONTRACT ADMINISTRATOR/ENGINEER PRIOR TO CONSTRUCTION. OFF HOUR CONSTRUCTION OR BY-PASS PUMPING MAY BE CONSIDERED SUBJECT TO APPROVAL BY THE ENGINEER/OWNER.
5. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO ENSURE NO TREES ARE DAMAGED OR REMOVED DURING CONSTRUCTION UNLESS SPECIFICALLY DESIGNATED.

TRENCHLESS TECHNOLOGY: HORIZONTAL DIRECTIONAL DRILL (HDD) NOTES & SPECIFICATIONS

1. GENERAL
   - A. PRIOR TO UNDERTAKING WORK BY HDD METHOD, THE OWNER'S CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES PROXIMAL TO THE WORK ZONE PRIOR TO CONSTRUCTION. SHOULD ANY DISCREPANCIES BE DISCOVERED IN RELATION TO THE CONTRACT DRAWINGS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
   - B. ADDITIONALLY, THE OWNER'S CONTRACTOR SHALL CONFIRM BORE AND RECEIVING PIT GEOMETRY, TARGET DEPTHS AND GRADES PRIOR TO CONSTRUCTION. ALL EQUIPMENT SHALL BE CALIBRATED TO THE SATISFACTION OF THE ENGINEER.
   - C. REFER TO APPLICABLE GEOTECHNICAL SITE INFORMATION TO CONFIRM PROPER EQUIPMENT AND MATERIAL SPECIFICATIONS. (DRILLING MIXES, SOIL TYPES ENCOUNTERED OR EQUIPMENT USED.)
   - D. THE OWNER'S CONTRACTOR SHALL UNDERTAKE HDD WORKS IN CONFORMANCE WITH OPSS 450 (NOVEMBER 2012) - CONSTRUCTION SPECIFICATION FOR PIPELINE AND UTILITY INSTALLATION IN SOIL BY HORIZONTAL DIRECTIONAL DRILLING.
2. WORKS & LAYOUT

   THE EXTENT OF SURFACE DISTURBANCE SHOWN ON THE PLANS IS BASED UPON AN ASSUMED BORE PIT CONFIGURATION; PRIOR TO CONSTRUCTION, THE OWNER'S CONTRACTOR SHALL SUBMIT A DETAILED PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER WHICH CONSIDERS THE DEPTHS, CONSTRUCTION AND REINFORCEMENT METHODS, EQUIPMENT, AND GENERAL APPROACH TO DIRECTIONAL DRILL LAYOUT AS PROPOSED BY THE OWNER'S CONTRACTOR DURING CONSTRUCTION OF THE WORKS.
3. MATERIALS & METHODOLOGY
   - A. BORING AND RECEIVING PITS SHALL BE OF SUFFICIENT SIZE TO CONTAIN THE DRILLING MUD AND SPOILS;
   - B. VERTICAL AND HORIZONTAL DRILL HEAD COORDINATES SHALL BE MONITORED AND LOCATION MAPPED DURING THE DRILLING OPERATION TO CONFIRM LINE AND GRADE.
   - C. THE BACKREAM HOLE DIAMETER SHOULD BE SUFFICIENT TO PERMIT PASSAGE OF THE PIPELINE O.D. AND JOINTS WHERE BUTT FUSION WELDING IS APPLICABLE;
   - D. THE OWNER'S CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF EXCESS DRILLING FLUID. SPOILS AND DRILLING FLUID ARE NOT PERMITTED TO BE DISPOSED OF INTO STREAMS OR INTO STORM, SANITARY OR OTHER DRAINAGE SYSTEMS. DISPOSAL SHALL COMPLY WITH LOCAL BYLAWS, REGULATIONS AND BEST MANAGEMENT PRACTICES;
   - E. THE OWNER'S CONTRACTOR SHALL PROVIDE A WRITTEN CONTINGENCY PLAN FOR CLEAN UP OF SURFACE SEEPAGE OF DRILLING FLUID BEFORE UNDERTAKING ANY SITE WORKS;
   - F. IF A DRILL HOLE MUST BE ABANDONED, THE OWNER'S CONTRACTOR SHALL FILL IT WITH GROUT OR CEMENT TO PREVENT FUTURE SUBSIDENCE;
   - G. TWO (2) TRACER WIRES SHALL BE INSTALLED ALONG THE DIRECTIONALLY BORED PIPE SEGMENTS IN ACCORDANCE WITH MUNICIPAL STANDARDS;
   - H. THE OWNER'S CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF ANY SUBSURFACE UTILITIES OR SERVICES THAT ARE DAMAGED DURING BORING, BACKREAMING OR OTHER ASSOCIATED OPERATIONS;
   - I. PRIOR TO UNDERTAKING DIRECTIONAL DRILL OPERATIONS, THE OWNER'S CONTRACTOR SHALL PREPARE AND SUBMIT A DETAILED WORK PLAN, A LIST OF EXPERIENCED PERSONNEL, A DRILLING FLUID MANAGEMENT PLAN AND A SAFETY PLAN FOR REVIEW BY THE ENGINEER.
   - J. DEWATERING SHALL BE ACCORDING TO OPSS 517.
   - K. OWNER'S CONTRACTOR SHALL ENSURE HDD OPERATIONS ARE UNDERTAKEN SO AS NOT TO EXCEED AN ALLOWABLE TENSILE LOAD (ATL) OR THE MIN. BEND RADIUS.
   - L. OWNER'S CONTRACTOR SHALL USE A PIPE LOAD MEASURING DEVICE TO ENSURE THAT THE MANUFACTURER'S RECOMMENDED PULLBACK FORCE IS NOT EXCEEDED.
   - M. PIPE ROLLERS, SKATES OR OTHER PROTECTIVE DEVICES SHALL BE USED TO PREVENT DAMAGE TO THE PIPE FROM THE EDGES OF THE PIT OR SUB-STRUCTURES DURING PULL-IN. ROLLERS SHALL BE USED UNDER PIPE TO PROTECT AGAINST GOUGES, ELIMINATE GROUND DRAG, AND REDUCE PULL-IN FORCE;
   - N. THE OWNER'S CONTRACTOR SHALL ENSURE THE HDD PRESSURES DO NOT INDUCE HYDRAULIC FRACTURING OF THE OVERBURDEN.
   - O. FOR FUSIBLE PIPE PRODUCTS, THE PIPE SHOULD BE COMPLETELY JOINTED PRIOR TO THE PULL BACK OPERATION TO AVOID DELAYS DURING INSTALLATION. ALL PIPE JOINTING SHALL BE TO MANUFACTURER RECOMMENDATIONS.
4. COMPLETION
   - A. UPON COMPLETION OF THE HDD OPERATION, THE OWNER'S CONTRACTOR SHALL PROVIDE COPIES OF THE VERIFICATION RECORDS AS CONSTRUCTED TO THE ENGINEER. AN AS-CONSTRUCTED PLAN AND PROFILE OF THE DIRECTIONAL BORE SHALL BE SUPPLIED TO THE ENGINEER;
   - B. OWNER'S CONTRACTOR SHALL UNDERTAKE WATER PRESSURE TEST (150psi) DURING SYSTEM COMMISSIONING TO VERIFY ALL PIPE CONNECTIONS.

RESTORATION NOTES:

SAWCUT & MILL ASPHALT PER DETAIL ON THIS SHEET. RESTORE AREAS DISTURBED AS FOLLOWS:
- 40mm HL3 SURFACE ASPHALT COMPACTED TO 97% M.R.D.
- 50mm HL8 BINDER ASPHALT COMPACTED TO 97% M.R.D.
- 150mm GRANULAR 'A' COMPACTED TO 100% SPMDD
- 300mm GRANULAR 'B' COMPACTED TO 100% SPMDD

THE PAVEMENT STRUCTURE SHALL BE REVIEWED BY A GEOTECHNICAL ENGINEER AND BASED ON THE APPROVAL OF THE NEWLY ESTABLISHED SUBGRADE.

SEDIMENT AND EROSION CONTROL NOTES

1. Protect all exposed surfaces and control all runoff during construction.
2. All erosion control measures to be in place before starting construction and remain in place until restoration is complete.
3. Maintain erosion control measures during construction.
4. All collected sediment to be disposed of at an approved location.
5. Minimize area disturbed during construction. All dewatering to be disposed of in an approved sedimentation basin.
6. Protect all catchbasins, manholes and pipe ends from sediment intrusion with geotextile (Terrafix 270R or approved equivalent).
7. Prevent wind-blown dust.
8. Obtain approval from UTRCA before construction for works which are in, or adjacent to floodlines, fill lines and hazardous slopes.
9. All silt fencing and details are at the minimum to be constructed in accordance with the Ministry of Natural Resources Guidelines on Erosion and Sediment Control for Urban Construction Sites.
10. All of the above notes and any sediment and erosion control measures are at the minimum to be in accordance the Ministry of Natural Resources Guidelines on Erosion and Sediment Control for Urban Construction Sites.

WATERMAIN (SERVICE) NOTES

1. The Contractor shall provide 48 hours advanced notice to the Municipal Water Operations Division prior to undertaking any work on the water system.
2. The watermain shall be AWWA C900 CL150 DR18 PVC (CSA B137.3) or AWWA C909 Cl150 PVCO (CSA B137.3) installed to a minimum depth of cover of 1.7m unless shown otherwise on the plan. Watermains and services shall be bedded in granular material (19mm max.) All PVC service pipe and fittings shall be mechanically restrained to City Standards, with 12 gauge tracer wire secured at 3.0 metre spacing and looped at each valve box. Corrosion protection shall be constructed per Municipality of Chatham/Kent Standard W-CS-25 and 441.05.16.
3. Where cover is less than 1.7m (even temporary conditions), the watermain/service shall be adequately insulated over the affected length.
4. Upon completion of water service installation, the Contractor is responsible for flushing, hydrostatic testing, disinfection and bacteriological testing of the water service in accordance with Municipality of Chatham-Kent specifications.
5. All water meters shall incorporate remote registers on the exterior of the building for ease of City access (Municipality of Chatham/Kent Standard W-CS-67).
6. All work shall meet the minimum standards and specifications of the Municipality of Chatham-Kent.
7. All watermains are to be installed in accordance with the minimum requirements of the latest revision of the Ontario Provincial Standard Specifications, the Ontario Building Code and the Municipality of Chatham-Kent.
8. Unless labelled specifically on the plans, all sewer pipe shall be as follows:
   - Products shall be as per the approved list of manufactures provided by the Municipality of Chatham-Kent.
   - HDPE is not permissible for use unless specified otherwise
   - The Owner's Contractor shall be responsible for protecting the pipe during construction in the event that protective cover depths are not met due to interim conditions.

   Service bedding: Pipe bedding spec. per bedding detail.
   Localized base improvement may be required for services bedded in loose, wet or dilatant silty/sandy subsoils, subject to the recommendations of a Geotechnical Engineer. Such improvement could include overexcavation and recompaction or crushed stone bedding wrapped in a geotextile (terrafix 270R or approved equivalent with min. 0.45m overlap) as directed by the Geotechnical Engineer. Any trench water shall be removed when pipe laying is in progress.
9. Backfill for service trenches: Services shall be backfilled with select native material or reclaimed granulars that are, in the opinion of the Geotechnical Engineer, suitable as backfill material and compacted to 95% SPMDD. Select natural on-site excavated subsoil can be used as trench backfill, provided the material is within 3 percent of the optimum moisture content. Otherwise, backfill material shall be imported Granular "C" compacted to 95% SPMDD. Backfill must be clean and compactible and free from organics and other undesirable contaminants.
10. The above noted backfill shall be compacted to the standard Proctor density specified in the soils report, or as approved by the Municipal Engineer.

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	No.	REVISIONS	DATE	CONSULTANT
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FILE: DEL18-011-C3D-BASE.DWG				

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development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
J. R. SMITH
100144789
May 16/18
PROVINCE OF ONTARIO

SCALE
SCALE - 1:250
2.5 0 5m

OUR LADY OF FATIMA CATHOLIC SCHOOL
515 BALDOON ROAD
CHATHAM, ONTARIO

NOTES AND DETAILS

PROJECT No. DEL18-011
SHEET No. SE2
PLAN FILE No.

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