

Request for Proposal

INSTITUTION: UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY

RFP NAME: ACE Base Building Extension

RFP #: RFPUOIT09062018

ADDENDUM NAME: Questions and Responses

ADDENDUM #: 1

The following information supplements and/or supersedes the bid documents issued on September 7, 2018

This Addendum forms part of the contract documents and is to be read, interpreted, and coordinated with all other parts. The cost of all contained herein is to be included in the contract sum. The following revisions supersede the information contained in the original drawings and specifications issued for the above-named project to the extent referenced and shall become part thereof.

GENERAL

- 1.1 Refer to Integral Groups Mechanical Addendum No. M-1 dated September 18, 2018 for revisions and clarifications to the mechanical drawings.
- 1.2 Refer to Integral Groups Electrical Addendum No. E-01 dated September 18, 2018 for revisions and clarifications to the electrical drawings.
- 1.3 Refer to sketch SKA-01 dated September 17, 2018 for an updated hardware schedule and room finish schedule.

- 1.4 Refer to sketch SKS-03 dated September 17, 2018 for clarification of the fire resistance ratings and types on the structural steel.
- 1.5 Refer to sketch SKS-01, SKS-02 and SKS-04 for remedial repair work at the existing concrete beams, floor, and columns to remain around the knock out panel. Refer to the attached sketches to also clarify the reinforced concrete knock out panel wall thickness and height designated for removal.
- 1.6 Refer to sketch SKA-02 dated September 20, 2018 for clarification of the precast wall composition.
- 1.7 Refer to the attached soil report prepared by V.A. Wood and Associates for Geotechnical information.
- 1.8 The work hours for the project shall be Monday - Friday 7:30am - 4:00pm. All work beyond the specified work hours must be approved by the University.
- 1.9 Refer to the attached specifications for the exterior gate section 11 14 00. Note all gate hardware to be included in the base bid (outdoor closure, pull, lockset, panic), see specifications for additional information.
- 1.10 Provide horizontal furring channels at 900mm c/c to support the interior liner panels.
- 1.11 Specification 09 53 00 Acoustical Suspension Item 2.1, Sentence 6 shall be modified to read Donn DX (22mm width).

Questions

1.12 Question: Are there mandatory subcontractors? i.e.: fire protection, BAS, Fire Alarms.

Answer: Siemens is the facility BAS and fire protection contractor for the facility and must be retained for this project.

1.13 Question: Are there any approved/recommended base building trades that can be contacted for pricing? In particular, Mechanical, Electrical, Roofing, Fire Alarm, Sprinklers, Controls, Data/Communication/etc.

Answer: No

1.14 Question: Bid documents listed a Commitment to Health & Safety. I do not believe it was included in the documents on Bidding. Please forward.

Answer: Refer to UOIT website. <https://usgc.uoit.ca/policy/policy-library/policies/legal,-compliance-and-governance/uoit-health-and-safety-policy.php>

1.15 Question: We assume any General Contractors who participate in this tender should have Union affiliation. Please confirm.

Answer: Union affiliation is preferred but not required for the project.

1.16 Question: Is there a preferred M&E subcontractors list?

Answer: No

1.17 Question: Can the tender closing be extended by 1 week to Friday October 12, 2018? This will allow for more competitive pricing from Trades/Subcontractors.

Answer: No

1.18 Question: We have attended the tender site visit on last Thursday September 13, 2018. We find the dead line for Questions/Enquires due date September 19, 2018 is too short for a bid closing on October 5, 2015. We request to extend the question dead line at least Friday, September 28.

Answer: September 26, 2018 by 3:00pm EST is the question period closing and the responses will be provided by October 1, 2018.

1.19 Question: We would like to request a 1 week extension to the closing of this project.

Answer: No

1.20 Question: Drawings call for paint on roof structure and Steel deck. Should columns and vertical braces receive paint also?

Answer: Yes, refer to attached updated finish schedule.

1.21 Question: Will access to water be provided by the university? Spec says "where access is available", but does not say if it is available.

Answer: There is not a hose bid on the west elevation of the building. However, where water is available to a reasonable extent within the storage yard it will be made available by the University.

1.22 Question: Confirm that contractor will have access/permission to use building hydro?

Answer: Yes, this is acceptable within reason and with the understanding that it will not disrupt the existing facility continued operation.

1.23 Question: Spec calls for site fencing to be 1.8m. At the site meeting 8' fencing was requested, Please confirm that 8' fencing is required.

Answer: 8'-0" construction fencing is required to isolate the construction area from the surrounding campus activities.

1.24 Question: As stated at the site meeting. Please confirm that winter heat is to be included by the GC in the base price?

Answer: Winter heat will remain included as part of the contractors base bid. Please note that the basement slab-on-grade and surrounding foundations will require heated protection to prevent frost action during construction until the building is enclosed. This responsibility and associated costs will be general contractors and must be included in the base bid.

1.25 Question: Please provide a Room Finish Schedule with clear instructions on extent of Painting.

Answer: See general addendum items for the response.

1.26 Question: Resilient Sheet Flooring. Does this only apply to the "Vinyl Base to match existing" notes on A207. This specification does not address vinyl base but rather a cove base with cap

Answer: The resilient sheet flooring is for the vinyl base to match existing. Refer to the attached revised specification 09 65 19.

1.27 Question: Exterior Rough Carpentry Spec. 06 10 63. Where are we to install this Trex Product?

Answer: All references to composite lumber shall be deleted as they are not applicable to the project.

1.28 Question: Exterior Wall Assembly 'W1' calls for a 19mm sheathing. Is this the same sheathing as the Glass Mat Exterior Gypsum Sheathing "GP DENS Glass Gold, 12.7mm as specified in Section 09 21 16?

Answer: The sheathing referenced on the W1 wall schedule shall be in accordance with the specification section 09 21 16 as noted above.

1.29 Question: Section 07 21 13 Building Insulation Item 2.2 Concrete Faced Insulated Wall Panels calls for "610mm x 1220mm by thickness indicated. For Wall Assembly 'W3' this is shown as 100mm. since this only comes in 50mm and 75mm thickness, can we use a 50mm thick and add 50mm Styrofoam SM to complete the assembly?

Answer: Making the composition for the panels as referenced above is unacceptable. Tech-Crete Concrete Faced Wall Panels provide the necessary insulation requirements.

1.30 Question: Is the concrete faced insulation panels to be removed per note on Drawing A201 the same thickness as the new? 100mm plus concrete face.

Answer: No, they are 2" insulated panels.

1.31 Question: Section 07 13 13 Bituminous Sheet Waterproofing calls for Drainage Sheet: as specified in Section 33 46 13. That specification is not provided. Is this still a requirement for both 'W3' and 'W4' wall types?

Answer: The drainage sheet is a requirement for both walls W3 & W4. Refer to the attached drainage sheet specification 33 46 13 for additional information.

1.32 Question: Please clarify extent of Cementitious Fireproofing. It is indicated on Building Section 1/A401 and also implied on Structural Elevation 4/S301 with only a notation "to receive 2 hour Fire Resistance Rating" which I am assuming is the Fireproofing.

Answer: Refer to the sketches in the general addendum items for clarification of the fire resistance ratings for the structural steel.

1.33 Question: Are there existing Building Details available showing reinforcing and thickness of both concrete walls and precast concrete panels to be sawcut and removed?

Answer: Refer to the sketches in the general addendum items for clarification of the concrete knock out panel and precast walls.

1.34 Question: Under Section 01 56 00 Temporary Barriers and Enclosures there are both Site Fencing and Hoarding specified. Please show on Site Plan what is expected for extents noting comments made at Pre Construction Site Visit.

Answer: The height of the construction hoarding has been clarified in a previous question. The limits of the construction fencing must be installed by the general contractor to FULLY isolate the construction area from the surrounding campus activities. This includes extending the hoarding down the west elevation where the treed areas slopes into ravine. The construction area must remain isolated with a minimum of 8'-0" temporary fencing or existing elevated (minimum 8'-0" in height) retaining walls or fencing from the campus activities at all times to restrict pedestrian access.

1.35 Question: Are the piles to be galvanizing required?

Answer: Yes

1.36 Question: Are the piles meant to be as a permanent load bearing element or temporary while construction takes place?

Answer: Permanent load bearing structural foundation.

1.37 Question: Are load tests required? If so, how many do we account for?

Answer: Yes, they shall be completed in accordance with ASTM D1143 Quick Test Method. Every five (5) installed piles shall be tested.

1.38 Question: Will a soil report be provided?

Answer: Yes it is attached.

1.39 Question: Where we have to cut the existing concrete slab on grade to connect plumbing, is the slab 8" thick similar to the SOG in the new area?

Answer: The slab is an 8" reinforced concrete slab on grade with a double mat of reinforcing steel.

1.40 Question: Please provide a room finish schedule for the 5th floor. Floor and Wall finishes are not shown.

Answer: Yes it is attached.

1.41 Question: Intumescent spec 07 81 23 is requested.

Answer: The specification has been attached.

1.42 Question: Please provide more information on the Jamison Door. Model # and local contact for supplier.

Answer: The contact retained during the design period is attached.

1.43 Question: Please ask the consultant to create a Room Finish Schedule.

Answer: Yes it is attached.

1.44 Question: Regarding the separate price covers phase 2 on the 5th floor. Can that work be removed all together, or awarded to a separate contractor; Or is it just for accounting purposes?

Answer: This work may not proceed depending on the project budget.

1.45 Question: Re: Wall type W3: The spec 07 21 13 calls for WallGUARD Concrete Faced Insulated Panels (made in USA). The drawing (3/A501) shows 100mm thick insulation. The maximum thickness of wallGUARD panels is 3" (76mm). Should I reduce the insulation thickness or carry an alternate? Note: Tech Crete (<http://www.techcrete.com/cfi.html>) is made in Canada and is available in 100mm thickness.

Answer: Refer to the previous question response regarding the cement faced rigid insulation.

1.46 Question: Currently, below spec for above mentioned project calls for BITUTHENE 4000 and EUCO DIAMOND HARD. We would like to request that our MEL ROL (waterproofing) and LIQUI HARD (densifier) please be reviewed for alternate approval. Attached is a submittal package to assist with review. If you could please forward to consultant and let me know if acceptable, it would be greatly appreciated.

Answer: The proposed alternative is acceptable.

1.47 Question: Can you confirm if this project is design/build or a stipulated price contract?

Answer: The project is a stipulated price contract.

1.48 Question: RFP Page 5 Item 6 Bonding Are electronic bonds required or is a scanned copy of the Bid Bond acceptable. Where do we upload the bonds in the Electronic Bid Form?

Answer: Please include a scanned copy of the bond with your technical proposal submission. If awarded this opportunity the successful Proponent must submit the original copies.

1.49 Question: Clarification of the Biddingo Electronic Bid Form is required. Bid Form Item 1 Request for Proposal Documents and Submission Instructions

- What are we to submit under this item?
- Reattachment says "Optional". What does this mean?

Answer: You are not required to re attach/upload anything for Item 1. In addition, you are not required to re attach/upload anything for Item 1.

1.50 Question: Bid Form Item 4 Financial Proposal Stage 2. What are we to submit under this item?

Answer: This section is mandatory. You are required to submit the Financial Proposal submission for Item 4. For assistance, please contact Biddingo at 905-756-0955.

1.51 Question: Bid Form Item 3 Technical Proposal Stage 1: What are we to submit under this item? The instructions say to "Go to Response Below; Click on the Item Number" I do not see this option anywhere.

Answer: This section is mandatory. You are required to submit the Technical Proposal submission for Item 3. For assistance, please contact Biddingo at 905 756 0955.

1.52 Question: Bid Form Item 2 Associated Bid Documents: What are we to submit under this item? The Zip file that is included includes all the tender documents including drawings. Reattachment says "Optional". What does this mean?

Answer: You are not required to re attach/upload anything for Item 2.

1.53 Question: The mechanical contractor requesting for clarification related to natural gas piping. In addition, we have not seen Soil report for this project please provide.

Answer: Gas piping shown in M300 gridline N1 is typo error. The mechanical consultant is issuing a separate addendum to clarify the gas piping.

1.54 Question: Delivery access point and the timing to enter the black and silver gate to ACE compound.

Answer: Normal delivery/access timing is between 7:30~4:00pm weekdays only. Construction deliveries loading/unloading shall be to the west side near the gate leading to building extension site to ensure no blockage to ACE operational deliveries. These gates could be opened through the security guard stationed in ACE main entrance. Any deliveries/work access after 4pm weekdays and during weekends shall be requested for proper arrangement. Advance notice of at least 3 working days shall be served for the arrangement of security officer.

In any case, if ACE has operational deliveries, it takes precedence over everything else. All construction personnel including drivers shall exit the compound until the ACE operation deliveries are completed which normally take place within 1-2 hours. A space behind the compound is available for temporary parking while waiting for ACE operational deliveries to complete and while waiting for the gate to open for early morning deliveries.

1.55 Question: Are the construction workers allowed to use/access the small gate at the southwest side of ACE?

Answer: Yes between 7:30~4:00pm weekdays.

1.56 Question: What is the procedure to access CWT basement & first level, timing, request notice and approval requirement?

Answer: Report to the guard at the ACE entrance between 7:30-4:00pm weekdays to access basement and first level. Entering the requested space shall be accompanied by ACE staff and only whenever it is safe to access the area.

1.57 Question: Any safety requirements to work inside CWT?

Answer: Work Permit system is being implemented inside ACE building and approval process takes 2 working days. The work permit should be approved no less than 24 hours prior to carrying out the work. Tie-in works shall be coordinated and notified minimum of 2 weeks in advanced.

1.58 Question: For pouring concrete what's the preferred /best timing that will not distract ACE operation?

Answer: Due to the school traffic congestion and frequent high profile scheduled deliveries in ACE, the concreting works is preferred after working hours or weekends. ACE will provide security guard on site during those working hours. Advance notice of at least 3 working days shall be served for the arrangement of security officer.

1.59 Question: In mobilizing cranes and concrete pump and delivery trucks/trailers, is there any protocol, submission beforehand?

Answer: A request of minimum 3 working days shall be submitted for any deliveries that exceeds 2 hours in parking inside the compound space. Whenever there is ACE high profile deliveries, construction deliveries shall be rescheduled or suspended for a duration of 1~2 hours and all non-ACE personnel shall be out of site. Continuous deliveries like concrete is preferred to be carried out during weekends or after weekdays work hours. Any permits required from the city shall be complied in conjunction with construction supervisor.

1.60 Question: Please advise if there is any other restrictions and requirements to follow.

Answer: No one is allowed to access inside existing ACE operational building without prior approval and sign-in through the ACE front security office.

1.61 Question: Please confirm contract type between owner and general contractor. The Bid Form indicated that it is CCDC 14 which is a design build contract, but the Supplementary Conditions are based on CCDC 2 – 2008

Answer: This project will be under a CCDC 2 – 2008 contract with supplementary conditions.

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 05 12 23 Structural Steel
- .2 Section 09 91 23 Interior Painting
- .3 Section 07 84 00 Firestopping
- .4 Section 07 81 16 Cementitious Fireproofing

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM D2240-15 Standard Test Method for Rubber Property—Durometer Hardness
 - .2 ASTM D2794-93(2010) Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
 - .3 ASTM D3960-05(2013) Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
 - .4 ASTM D4060-14 Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
 - .5 ASTM E84-17 Standard Test Method for Surface Burning Characteristics of Building Materials
 - .6 ASTM E119-16a Standard Test Methods for Fire Tests of Building Construction and Materials
 - .7 ASTM E595-15 Standard Test Method for Total Mass Loss and Collected Volatile Condensable Materials from Outgassing in a Vacuum Environment
 - .8 ASTM E736/E736M-17 Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
 - .9 ASTM E759/E759M-92(2015)e1 Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members
 - .10 ASTM E761 / E761M - 92(2015)e1 Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members
- .2 Association of the Wall and Ceiling Industries - International (AWCI)
 - .1 Technical Manual 12-B, Standard Practice for the Testing and Inspection of Field Applied Thin-Film Intumescent Fire-Resistive Materials; an Annotated Guide.
- .3 Underwriters' Laboratories of Canada (ULC)
 - .1 List of Equipment and Materials, Fire Resistance, current edition.
- .4 Underwriters Laboratories Inc. (ULI)
 - .1 Fire Resistance Directory, Volume 1, current edition.
 - .2 CAN/ULC-S101-M, Standard Methods of Fire Endurance Tests of Building Construction and Materials.
- .5 Intertek Testing Services / Warnock Hersey International, Inc. (ITS/WH):
 - .1 Directory of Listed Products, current edition.

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data: Submit product data for specified products. Include product data indicating product characteristics, performance and limitation criteria.

- .3 Quality Assurance/Control Submittals:
 - .1 Design Data: ULC and FM published test designs for fire resistive coating application to substrate materials required and test reports showing compliance with specified physical performance characteristics and physical properties.
 - .2 Manufacturer's Instruction: Manufacturer's installation instructions.
- .4 Submit MSDS for each product as applicable, prior to delivery of any materials to the site.

1.5 Quality Assurance

- .1 Manufacturer Qualifications:
 - .1 Company specializing in manufacturing products of this section for a minimum of 10 years.
 - .2 Company's quality management system shall have been assessed and registered by an independent registrar as conforming to the requirements of the standard ISO 9001:1994.
- .2 Applicator Qualifications:
 - .1 Approved, certified and supervised by manufacturer of fire resistive coating materials.
 - .2 Company shall have minimum five years documented experience.
- .3 Product Qualifications:
 - .1 Manufactured under ULI, ULC, ITS/WH and/or FM Follow-up Programs. Each container or package shall bear ULI, ULC, ITS/WH and/or FM label.
- .4 Field Samples: An independent testing laboratory/company shall be selected by the Consultant to test random samples as applied, to verify thickness of thin-film intumescent fire-resistive coating in accordance with AWCI Technical Manual 12-B, Standard Practice for the Testing and Inspection of Field Applied Thin-Film Intumescent Fire Resistive Materials; an Annotated Guide. Inspection shall be carried out immediately following final thickness of thin film intumescent coatings and just before application of topcoat.
- .5 Regulatory Requirements: Conform to applicable codes for fire resistance ratings. Submit certification of acceptability of fire resistive coating materials to consultant and authority having jurisdiction.

1.6 Job Conditions

- .1 Environmental Requirements
 - .1 Protect work area from windblown dust and rain. Protect adjacent areas from overspray.
 - .2 Provide ventilation in areas to receive work of this Section, during application and for 24 hours (minimum) after application.
- .2 Provide metal pans or adequate tarpaulin to protect surfaces in areas assigned for the storage and mixing of paints.
- .3 Temperature and Humidity Requirements:
 - .1 Do not apply thin-film intumescent fire-resistive coating when temperature of substrate and/or surrounding air is below 10°C. Use electric or natural gas heat, if supplemental heat is required.

- .2 Relative humidity of 40 percent to 60 percent is recommended in work area. Relative humidity in work area must not exceed 75 percent throughout the total period of application and drying for the intumescent coating, and must not exceed 65 percent throughout the application and drying for the protective decorative finish coat.
- .3 Manufacturer's recommended temperature and humidity conditions must be maintained throughout the entire application and drying period until intumescent coating and basecoat are fully dried and top coated, including any interim period prior to application of the topcoat.

1.7 Sequencing and Scheduling

- .1 Sequence work in conjunction with ceiling hanger tabs, sprinkler pipes, HVAC systems and other mechanical systems, structural steel installation.
- .2 Do not apply thin-film intumescent fire-resistive coating until concrete toppings and/or roofing applications have been installed.
- .3 Steel surfaces with less than 1 meter clear working access may necessitate the application of materials to inaccessible surfaces prior to erection of the finished steel members, either at the point of fabrication or on-site.

1.8 System Descriptions

- .1 Design Requirements: Thin-film intumescent fire-resistive coating system shall provide a fire resistance rating as indicated on the drawings.

1.9 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification label intact.
- .4 Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
- .5 Store materials at a temperature not less than 10 degrees C in a dry, protected area, off ground in original, undamaged, sealed containers with manufacturer's labels and seals intact.
- .6 Protect from freezing.
- .7 Do not store in direct sunlight.
- .8 Discard any materials that have come into contact with contaminants prior to actual use.

1.10 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Manufacturers

- .1 A/D Fire Protection Systems, 420 Tapscott Rd., Scarborough, Ontario M1B 1Y4.
- .2 Equivalent products as manufactured by the following are acceptable subject to compliance with performance requirements specified herein.
 - .1 3M
 - .2 Cafco Industries Inc,
 - .3 Carboline

2.2 Products

- .1 Proprietary Systems: A/D FIREFILM III Intumescent Coating.
- .2 Primer: Select primer from manufacturer's list of approved primers, or other only as approved by manufacturer.
- .3 Basecoat: A/D BASECOAT by A/D Fire Protection Systems.
- .4 Top Coat: A/D COLORCOAT by A/D Fire Protection Systems.
- .5 Products/Systems Testing: Listed by ULC and bearing the ULC label.

2.3 Materials

- .1 Fire Resistive Coating Material: Thin-film, intumescent coating: A/D FIREFILM III as manufactured by A/D Fire Protection Systems listed by ULC and bearing ULC label on each container or package.
 - .1 Water based.
 - .2 Hardness (Shore "D"): Durometer D81.8, creep 1 at 15 s, 230 degrees C.
 - .3 Surface Burning Characteristics (ASTM E 84): Flame Spread: 0-20, Smoke Development: 0-50, Class "A".
 - .4 Density 1,366 g/l.
 - .5 Dry Weight: 2.2 kg/m² at 1.6 mm dry.
 - .6 Cohesion/Adhesion (Bond or Tensile) (ASTM 736): 3.24 kgm² at 3 mm dry.
 - .7 Compressive strength (ASTM E 761): 7.6 MPa at 10 percent deformation.
 - .8 Deflection Resistance (ASTM E 759): Pass with out spalling, cracking or delaminating.
 - .9 Impact Resistance (ASTM D2794): 3.3 kg-m (direct) at 3 mm, 1.4 kg-m (direct) at 1.6 mm.
 - .10 Abrasion Resistance (ASTM D4060): 508 cycles per mil at 1.6 mm dry.
 - .11 Off gassing (ASTM E595): TML 0.82, CVCM 0.00, WVR 0.49), NASA SP-R-0022A and ESA PSS-01-702.

2.4 Mixing

- .1 Paints shall be ready mixed.
- .2 Mix gently in order to minimize introduction of air to the product. Do not add water or solvent.
- .3 Mix topcoat by boxing and stirring. Do not add water or solvent.

PART 3 EXECUTION

3.1 Inspection

- .1 Examine surfaces to receive work of this Section and report any defects that may affect the work of this section. Identification marking of steel components must be by wax crayon to facilitate ease of removal prior to application of this intumescent fireproofing.
- .2 Verify that substrate surfaces have been prepared in accordance with manufacturer's recommendations.
- .3 Verify that all clips hangers, sleeves and similar devices have been attached. Confirm compatibility of surfaces to receive fireproofing materials. Steel surfaces must be primed with a compatible primer.
- .4 Beginning of installation means acceptance of substrate.
- .5 Verify substrate and workspace temperature and humidity conditions are in accordance with manufacturer's recommendations.

3.2 Preparation

- .1 Protection: Protect adjacent surfaces, work areas, finished surfaces and equipment from over-spray/damage during product application.
- .2 Surface Preparation: Clean substrate free of dust, dirt, grease or other foreign matter that would impair bond of fire resistance material.
- .3 Weld flashes shall be ground smooth prior to commencement of application.

3.3 Installation

- .1 Apply primer and basecoat by spray application in accordance with manufacturer's product data, including technical bulletins, product catalogue, application instructions and product markings for installation in sufficient thickness to achieve required fire resistance rating.
- .2 Priming: Apply only to primed surfaces. Use only primer as approved by manufacturer. Follow primer manufacturer's instructions.
- .3 Apply topcoat decorative finish according to manufacturer's recommendations.
- .4 Application Rates and Thickness Measurements:
 - .1 Comply with fire test designs or manufacturer's thickness selection tables for determination of dry film thickness of intumescent coatings required for size of steel element to be protected and for required fire resistance ratings.
 - .2 Apply basecoat at a maximum rate of 60-mil wet per coat.
 - .3 Apply intumescent coatings at a maximum rate of 1.14 mm wet or approximately 0.58 mm dry per coat.
 - .4 Final dry film thickness must be measured with a dry-film thickness gauge. For method of thickness determination refer to AWCI Technical Manual 12-B, Standard Practice for the Testing and Inspection of Field Applied Thin-Film Intumescent Fire-Resistive Materials; an Annotated Guide.

3.4 Application

- .1 Spray Equipment: Use equipment recommended by manufacturer.
- .2 Drying and Recoat Time: Drying time will vary with temperature and humidity conditions. Apply next coat only after previous coat is dry.
- .3 Topcoat Application:
 - .1 Allow a minimum of 24 hours between application of the final coat of basecoat and application of topcoat. Recommended site conditions must be maintained for any interim period after final coat of basecoat and until topcoat has been applied and dried. Basecoat must be dry before application of topcoat.
 - .2 Do not apply topcoat until it has been determined that the required dry film thickness of basecoat materials has been provided.
 - .3 Thickness: Apply topcoat to a minimum dry film thickness of 0.05 - 0.10 mm.
- .4 Patching: Patch and repair any fire resistive coating that has been damaged in accordance with patching recommendations of material manufacturer. If coating becomes damaged, rebuild thickness by spray or brush. Fill small areas with trowel. When dry, smooth and finish with topcoat to match

3.5 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions. Remove and legally dispose of construction debris.

3.6 Protection

- .1 Protect intumescent coatings from damage until date of Substantial Performance.
- .2 Touch up any areas damaged in accordance with manufacturer's recommendations and to the entire satisfaction of the Consultant.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

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

1.3 References

- .1 ASTM International (ASTM)
 - .1 ASTM E84-17 Standard Test Method for Surface Burning Characteristics of Building Materials
 - .2 ASTM F710-17 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
 - .3 ASTM F1066-04(2014)e1 Standard Specification for Vinyl Composition Floor Tile
 - .4 ASTM F1344-15 Standard Specification for Rubber Floor Tile
 - .5 ASTM F1861-16 Standard Specification for Resilient Wall Base
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-25.20, Surface Sealer for Floors.
 - .2 CAN/CGSB-25.21, Detergent-Resistant Floor Polish.
- .3 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102.2, Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.
- .4 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1168-03, Adhesives and Sealants Applications.

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit duplicate samples of manufacturer's full range of colours for specified products for selection of colours by the Consultant.
- .3 Before any resilient flooring materials are delivered to the job site, submit to the Consultant, a complete list of all materials proposed to be furnished and installed under this portion of the Work, stating manufacturer's name and catalogue number for each item, and product samples in colours specified.
- .4 Accompanying the materials list, submit two copies of the manufacturer's current recommended method of installation for each item.
- .5 Provide maintenance data for resilient flooring for incorporation into Operation and Maintenance Manual specified in Section 01 78 00 – Closeout Submittals.

1.5 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.

- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.
- .3 Use all means necessary to protect resilient flooring materials before, during and after installation and to protect the installed work and materials of all other trades.

1.6 Extra Materials

- .1 Provide extra stock materials of resilient flooring, base and adhesives in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Provide one carton of each colour, pattern and type flooring material required for this project for maintenance use.
- .3 Provide one container of adhesive.
- .4 Extra materials to be from same production run as installed materials.
- .5 Clearly identify each container of floor tile and each container of adhesive.

1.7 Environmental Requirements

- .1 Maintain air temperature and structural base temperature at floor installation area above 20° C for 48 hours before, during and after installation.

1.8 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

1.9 Warranty

- .1 Warrant the work of this Section against defects of workmanship and material, for a period of ten (10) years from the date of Substantial Performance and agree to make good promptly any defects which occur or become apparent within the warranty period.

PART 2 PRODUCTS

2.1 Materials

- .1 Resilient Base: To ASTM F1861, 100 mm high thermoplastic rubber, not less than 3.0 mm gauge with preformed internal and external corners. Base at resilient tile shall have standard toe.
 - .1 Johnsonite DuraCove DC Rubber Wall Base.
 - .2 Roppe Pinnacle Rubber Base.
 - .3 Amtico Marathon.
 - .4 Burke Mercer BurkeBase.
- .2 Primers, Adhesives and Caulking: non-flammable, solvent free, waterproof, recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade.
- .3 Sub-floor filler and leveler shall be white premixed latex compatible with flooring products and adhesive as recommended by flooring manufacturer for specific flooring types.

- .4 Metal edge strips: aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.
- .5 Transition strips, mouldings and adaptors shall be rubber or vinyl, manufactured by Johnsonite, Roppe or Burke Mercer with lip to extend under floor tile with tapered edge, colour matched to flooring.
- .6 Sealer: to CAN/CGSB25.20, Type 2-water based, type recommended by flooring manufacturer.
- .7 Wax: to CAN/CGSB-25.21, type recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 Surface Conditions

- .1 Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- .2 Confirm that resilient base may be installed in accordance with the original design and the manufacturer's recommendations.
- .3 In the event of discrepancy, immediately notify the Consultant.
- .4 Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 Base Application

- .1 Lay out base to keep number of joints to a minimum. Locate joints at maximum available spacing or at internal or pre moulded corners.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using a 3 kg hand roller.
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use pre-moulded end pieces at flush door frames.
- .7 Cope internal corners. Use pre moulded corner units for right angle external corners. Use formed straight base materials for external corners of other angles, minimum 300 mm each leg.
- .8 Provide rubber base at all locations specified, regardless of floor finish.

3.3 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

- .2 Remove excess adhesive from resilient floor coverings, base and adjacent finished surfaces as the work progresses.
- .3 Clean, seal and wax floor and base surfaces to manufacturer's instructions. In carpeted areas, clean base before installation of carpet.

3.4 Protection

- .1 Protect new floors until time of final inspection.
- .2 Prohibit traffic on floors for 48 hours after installation.
- .3 Immediately prior to final inspection, remove protection, clean, dry or damp mop resilient flooring and apply one additional coat of wax.

End of Section

PART 1 GENERAL

1.1 Section Includes

- .1 This section covers the furnishing and installation of a PMG-03-01-10 Pedestrian pre-hung Gate with 50" rough opening, (42" clear opening).

1.2 Related Sections

- .1 Section 08710 Door Hardware

1.3 Quality Assurance

- .1 Manufacturer shall be a company specializing in the supply of security gates with a minimum of 10 years' experience.
- .2 Installer shall have a minimum of one year experience installing similar equipment, or shall supply a factory representative during installation of the product.

1.4 Submittals

- .1 Submit manufacturer's descriptive literature for specified equipment, including options.
- .2 Provide dimensional layout, installation instructions and anchoring instructions.
- .3 Provide shop drawings.

1.5 Delivery, Storage and Handling

- .1 Deliver materials to job site in manufacturer's packaging undamaged, complete with installation instructions.
- .2 Store off ground, under cover, protected from weather, construction activities and debris.
- .3 Use forklift and pallet jack equipment as required for moving.

1.6 Project/Site Conditions

- .1 Install the Pedestrian Pre-Hung Gate on adjacent concrete walls and level grade.

1.7 Warranty

- .1 Provide warranty on products against defects in material and workmanship for a period of one (1) year from the date of invoicing. The warranty covers defects in materials and workmanship and does not cover freight, labor or incidental costs.

PART 2 PRODUCTS

2.1 Manufacturer

- .1 Wallace Perimeter Security
Model FOLDSMART XT Contact Wallace Perimeter Security:
90 Lawson Crescent, Winnipeg, Manitoba Canada, R3P 2H8
T. 866.300.1110 F. 204.284.1868
wallaceperimetersecurity.com

Or approved equivalent.

2.2 Product

- .1 Pedestrian pre-hung Gate. Features of the gate shall include: key lock control with stainless steel pull handle in the entry direction; mechanical push bar exit control; hydraulic outdoor closer gate to include mesh infill and hydraulic closing mechanism.
- .2 All hardware for the gate shall be included in base bid.

2.3 Construction

- .1 Gate:
 - .1 The Gate is a fully welded assembly consisting of 2" square vertical and horizontal structural steel tubing.
- .2 Gate Frame:
 - .1 The Gate Frame is a fully welded assembly consisting of 2" square vertical and horizontal structural steel tubing. The frame includes two welded ½" thick base plates for mounting to a concrete pad (sidewalk).
- .3 Infill:
 - .1 UniFence welded wire infill panels (standard) are fabricated from heavy-duty steel wire, (2 x 0-Ga. horizontal and 1 x 4-Ga. vertical) welded at each intersection into a solid one-piece mesh. Infill panels are welded to the upper and lower sections at all wire locations vertically and horizontally.
 - .2 Vertical pickets, 1 ½" x 1 ½" x 1/8" structural steel angle, oriented at 45° and evenly spaced at 4 ½" on center and welded into the upper and lower sections of door panel.
- .4 Hydraulic Closure:
 - .1 The hydraulic gate closure mechanism is to be outdoor rated, and of a strength to close the weight of the given size of gate.

2.4 Equipment

- .1 General: The gate shall have the ability to provide free passage in both directions; free passage in one direction and controlled passage in the opposite direction.

2.5 Factory Testing

- .1 Product shall be fully tested at the factory prior to shipment.
- .2 Check all mechanical connections.
- .3 Check all electrical connections.
- .4 Inspect product finish. Touch up prior to shipment.

2.6 Security Equipment

- .1 Reader or Activation Device Integration: Card readers or activation devices are to be installed in the field by installer on the card reader mounting plates provided by the manufacturer. Readers and installation are not part of the product.

2.7 Finish

- .1 Powder Coat: All exterior components are to be painted in a powder coat color specified by the project requirements.

PART 3 EXECUTION

3.1 Installation

- .1 Provision of concrete foundations as determined by local engineer according to drawings provided.
- .2 Install high-speed security gate to manufacturer's written instructions.

3.2 Cleaning and Maintenance

- .1 Perform cleaning and maintenance procedures in strict accordance with manufacturer's written instructions.
- .2 Maintain logbook of repairs and maintenance.

End of Section

PART 1 GENERAL

1.1 General

- .1 Conform to the requirements of Division 1.

1.2 Related Sections

- .1 Section 03 30 00 Cast-in-Place Concrete
- .2 Section 07 13 13 Bituminous Sheet Waterproofing
- .3 Section 07 21 13 Building Insulation
- .4 Section 31 23 10 Excavating, Trenching and Backfilling

1.3 References

- .1 Canadian Standards Association (CSA)
 - .1 CAN/CSA-A23.1-14 Concrete Materials and Methods of Concrete Construction.
 - .2 CAN/CSA-B182.1- 02 Plastic Drain and Sewer Pipe and Pipe Fittings.
- .2 Ontario Building Code, Part 7 - Plumbing.
- .3 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 1840 Material Specification for Non-Pressure Polyethylene (PE) Plastic Pipe Products

1.4 Submittals

- .1 Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product data: Submit manufacturer's Product data indicating:
 - .1 Two copies of manufacturer's Product data on characteristics, performance criteria, and limitations.
 - .2 Preparation, installation requirements and techniques, Product storage, and handling criteria.

1.5 Shipping, Handling and Storage

- .1 Refer to Section 01 61 00 – Common Product Requirements.
- .2 Deliver, handle and store materials in accordance with manufacturer's printed instructions.

1.6 Waste Management and Disposal

- .1 Refer to Section 01 74 19 – Construction Waste Management and Disposal.

PART 2 PRODUCTS

2.1 Materials

- .1 Perforated plastic pipe and fittings: to CSA 182.1. Nominal pipe size 100 mm diameter. Drainage tubing manufactured from high density polyethylene resin which meets or exceeds the requirements of Type III, Category 4 or 5, Grade P33 or P34, Class C as per ASTM D1248.
- .2 Joining System: snap, insert or split coupler
- .3 Filter Sock: Woven polyester.

- .1 Acceptable product: Big 'O' Perforated Corrugated with Polyester Sock Filter as manufactured by Armtec Ltd.
- .4 Coarse filter aggregate: to CAN/CSA-A23.1, Table 2, Group 1, 20-5 mm.
- .5 Fine filter aggregate: to CAN/CSA-A23.1, Table 1.
- .6 Filter mat: Non-Woven Polypropylene Geotextile
 - .1 Terrafix 270R by Terrafix Geosynthetics Inc.
 - .2 Mirafi 140N by TC Mirafi.
- .7 Drainage sheet: Terradrain 600 by Terrafix Geosynthetics Inc. or Mirafi Drainage Composite by TC Mirafi.
- .8 Window Well Drainage System: Tie into the perimeter drainage system by means of a 150 mm capped pipe extension up from the drain line to the base of the well. Attach pipe to concrete wall with metal strapping.
- .9 Area Drains: Oatey 82378 102 mm ABS Adjustable General Purpose Pipe Fit Drain with 254 mm cast nickel grate & round top or equivalent.

PART 3 EXECUTION

3.1 Layout

- .1 Establish grades and inverts from appropriate bench marks. Lay out lines as shown on Drawings.
- .2 Slope drainage pipes at least 1%. Pipe grade shall not vary more than 10% of internal diameter of pipe within a given run. Such deviation shall be gradual and over a distance of not less than 9.0 m.
- .3 Lay pipe in straight lines; turn corners using 45° bends.

3.2 Installation

- .1 Coordinate work of this Section with that of other related Sections.
- .2 Do not place pipe in direct contact with rigid materials such as rock, brick, or wood. Do not use grade stakes, stones, masonry or concrete fragments or any type of shim under pipe.
- .3 Join pipe sections by means of couplings. Provide end plugs on open ends of pipe runs at high points. Provide fittings such as elbows, bends, tees, adapters, reducers, as required to form a complete drainage system. Carefully tap tapered fittings into pipe; do not overdrive.
- .4 Install perforated pipe with holes and coupling slots facing down.
- .5 Aggregate materials shall be damp when placed. If necessary, spray with water using fog nozzle to assist hydraulic consolidation.
- .6 Place aggregate materials by hand around and above pipe in successive 150 mm lifts.
- .7 Consolidate each lift by tamping moderately; prevent damage to pipes.
- .8 Do not cover pipes until inspected and approved by Consultant.

- .9 Supply rigid non-corrosive sleeves for insertion into foundation walls and other building elements where pipe penetrates such elements. Sleeve diameter shall be 50 mm larger than pipe diameter. Pack joint between pipe and sleeve with moisture resistant compressible pre-moulded filler.

3.3 Perimeter Drainage

- .1 Provide perimeter drainage at outside of external foundation walls.
- .2 Connect to existing subdrainage system.
- .3 Place filter fabric into prepared excavation. Size filter fabric to completely wrap drainage course, lapping at joints minimum 300 mm.
- .4 Place minimum 150 mm coarse filter aggregate on top of filter fabric and consolidate.
- .5 Lay drainage pipe to layout shown. Unless other size is indicated, provide 100 mm diameter perforated pipe. Connect to existing outfall as directed by Owner's Representative.
- .6 Provide minimum 150 mm thick coarse filter aggregate at sides and top of drainage pipe.
- .7 Close filter fabric over top of drainage course and secure lap in place.
- .8 Cover filter fabric with 300 mm fine filter aggregate.
- .9 Install area drain at exterior stair lower level landing in accordance with manufacturer's instructions and connect to foundation drainage system.
- .10 Install window well drains. Connect vertical piping to foundation walls with galvanized metal straps at 600 mm c/c.

3.4 Drainage Sheet

- .1 Ensure that waterproof membranes have been inspected and approved prior to placing drainage sheet.
- .2 Place panels with flat side against waterproofed foundation walls and filter fabric facing soil. Secure panels to substrate with two sided tape or adhesive, compatible with substrate material.
- .3 Connect adjacent panels at the longitudinal edge by pulling the filter fabric back to expose the flange. Place flangeless panel edge on top of the flange of the adjacent panel and butt dimple to dimple.
- .4 Complete panel and attachment by pulling the filter fabric back to expose two rows of dimpled core. Place end of the next panel over the two rows of dimples and interlock.
- .5 Complete all connections in single fashion from top to bottom so that moisture will flow with the overlap and not against it.
- .6 Overlap fabric in the direction of water flow. Secure all terminal edges with the filter fabric flap by tucking it behind the core.
- .7 Overlap drain sheet filter fabric over perimeter drain filter fabric.

- .8 Coordinate with Section 31 23 10 to ensure that drainage sheet is covered with backfill within maximum two weeks of its installation.

3.5 Inspection

- .1 Arrange for inspection of foundation drainage systems by Municipal Inspectors and the Consultant prior to placing backfill.

3.6 Cleaning

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.

End of Section

	ROOM SCHEDULE												
	ROOM			FLOOR	BASE	WALLS				CEILING	CEILING HEIGHT	REV.	REMARKS
	NO.	ROOM NAME				NORTH	EAST	SOUTH	WEST				
BASEMENT	001	MAINTENANCE ROOM	MAT.	CONC.	–	CONC.	CONC.	CB	CONC.	CONC.	5150	–	
			FIN.	S	–	P	P	P	P	P	–	–	
	002	MECHANICAL ROOM	MAT.	CONC.	–	CB	CONC.	CONC.	CB	CONC.	5150	–	
			FIN.	S	–	P	P	P	P	P	–	–	
	003	CORRIDOR	MAT.	CONC.	–	CB	CB	CONC.	CONC.	CONC.	5150	–	
			FIN.	S	–	P	P	P	P	P	–	–	
FIRST FLOOR	101	MAINTENANCE ROOM	MAT.	CONC.	–	CB	CB	CONC.	CONC.	EXP.	7015 MIN.	–	
			FIN.	S	–	P	P	P	P	P	–	–	
FIFTH FLOOR	501	OFFICE	MAT.	EX.	R	EX.	GB	GB	EX.	EX./ACT	EX.	–	PAINT NEW AND EXISTING GYPSUM BOARD. HOLLOW METAL FRAME FINISH TO REMAIN. REPLACE CEILING AND RUBBER FLOOR TILES AS REQUIRED
			FIN.	EX.	–	EX.	P	P	P/EX.	–	–	–	
	502	OFFICE	MAT.	EX.	R	GB	GB	EX.	EX.	ACT	EX.	–	PAINT NEW AND EXISTING GYPSUM BOARD. HOLLOW METAL FRAME FINISH TO REMAIN. REPLACE CEILING AND RUBBER FLOOR TILES AS REQUIRED
			FIN.	EX.	–	P	P	EX.	P/EX.	–	–	–	
	503	OFFICE	MAT.	EX.	R	GB	EX.	EX.	EX.	EX.	EX.	–	
			FIN.	EX.	–	P	P	EX.	P	–	–	–	
	ACE 5002	LOUNGE	MAT.	EX.	R	EX.	EX.	GB	EX.	EX.	EX.	–	PAINT NEW WALL TO MATCH EXISTING. RUBBER BASE ALONG NEW WALL TO MATCH EXISTING.
			FIN.	EX.	–	EX.	EX.	P	EX.	–	–	–	
ACE 5010	CONFERENCE ROOM	MAT.	EX.	R	EX.	EX.	EX.	GB	EX.	EX.	–	PAINT NEW WALL TO MATCH EXISTING. RUBBER BASE ALONG NEW WALL TO MATCH EXISTING.	
		FIN.	EX.	–	EX.	EX.	EX.	P	–	–	–		

NOTES:

1. PROVIDE SEPARATE PRICE FOR FIFTH FLOOR WORK
2. ALL EXPOSED STRUCTURAL STEEL COLUMNS AND BRACING SHALL BE PAINTED

ABBREVIATION LEGEND:

ACT	ACOUSTIC CEILING TILE
CB	CONCRETE BLOCK
CONC.	CONCRETE
EX.	EXISTING
EXP.	EXPOSED
GALV.	GALVANIZED
GB	GYPSUM BOARD
HM	HOLLOW METAL
P	PAINT
R	RUBBER BASE
S	CONCRETE SEALER

BASEMENT FLOOR	DOOR AND FRAME SCHEDULE																												
	DOOR						FRAME					FIRE RATING	DOOR HARDWARE															REMARKS	
													HINGES	CONT. HINGE	CLOSER	DOOR STOP	THRESHOLD	KICK PLATE	ARMOR PLATE	DOOR OPERATOR	PANIC DEVICE	LOCKSET	ELECTRIC STRIKE	PUSH PLATE	WEATHER STRIPPING	PUSH TO LOCK	DOOR PULL		DEAD BOLT
	NO.	SIZE AND THICKNESS	TYPE	MATERIAL	FINISH	GLASS	TYPE	DETAIL		MATERIAL	FINISH																		
							HEAD	JAMB																					
	001	(2) 5436x4900	JAMISON	DOORS. REFER TO	MANUFACTURER SPECIFICATION	FOR INSTALLATION	DETAILS						DOOR HARDWARE BY SUPPLIER															-	
	001A	(2) 915x2130x45	M	HM	PAINT	-	F1	H5	J5	HM	PAINT		●		●		●		●	●							DOOR SILL LOCATED 1400 ABOVE NEW MAINTENANCE ROOM SLAB		
	002	915x2130x45	M	HM	PAINT	-	F1	H5	J5	HM	PAINT		●		●		●	●									DOOR SILL LOCATED 1400 ABOVE NEW MAINTENANCE ROOM SLAB		
	002A	(2) 915x2130x45	M	HM	PAINT	-	F1	H1	J1	HM	PAINT		●		●		●		●	●							-		
	003	915x2130x45	M	HM	PAINT	-	F1	H1	J1	HM	PAINT		●		●		●		●	●							-		
	003A	915x2130x45	M	HM	PAINT	-	F1	H2	J2	HM	PAINT		●		●		●	●				●					-		
	004	915x2130x45	-	-	GALV.	-	-	-	-	-	GALV.		●		●				●	●							EXTERIOR RATED PRE-HUNG STEEL MAN DOOR C/W PANIC HARDWARE		
FIRST FLOOR																													
		101	4880x4730x45	OCD	HM	PAINT	-	F1	H4	J4	HM	PAINT		DOOR HARDWARE BY SUPPLIER															-
		101a	915x2130x45	M	HM	PAINT	-	F1	H3	J3	HM	PAINT		●		●		●	●				●				-		
		101b	915x2130x45	M	HM	PAINT	-	F1	H3	J3	HM	PAINT		●		●		●	●	●	●		●				PROVIDE EXTERIOR GRADE CARD READER ON EXTERIOR		

PROJECT:

UOIT A.C.E. BUILDING EQUIPMENT BAY EXPANSION

UOIT OSHAWA CAMPUS
60 FOUNDERS DRIVE. OSHAWA ON. L1H 7L7

UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY

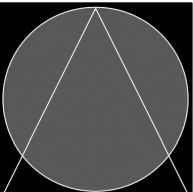
DRAWING:

ROOM FINISH SCHEDULE

DO NOT SCALE THE DRAWINGS
CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.

ALL DRAWINGS, SPECIFICATIONS AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE CONSULTANT AND MUST BE RETURNED UPON REQUEST. REPRODUCTION OF DRAWINGS IN PART OR WHOLE WITHOUT THE PERMISSION OF THE CONSULTANT IS FORBIDDEN.

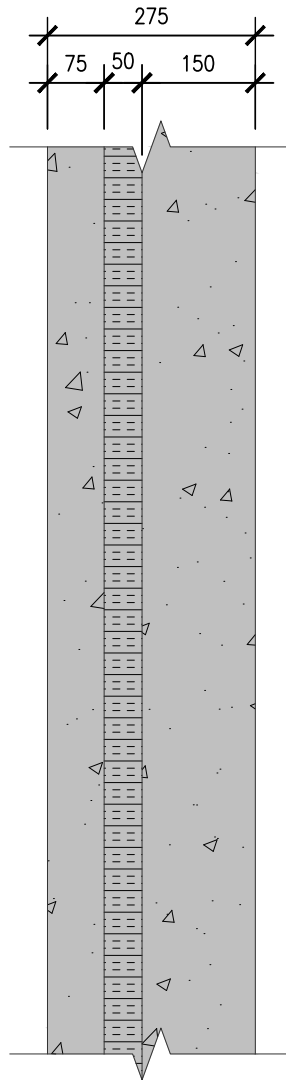
DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED AND SEALED BY THE CONSULTANT.



BARRY BRYAN ASSOCIATES
Architects
Engineers
Project Managers
250 Water Street
Suite 201
Whitby, Ontario
L1N 0G5
Tel: (905) 666-5252
Fax: (905) 666-5256
e-mail: bba@bba-archeng.com

PROJECT NO:
18033

DESIGN BY: BBA	DOC CONTROL DATE:
DRAWN BY: JJ	% COMPLETE:
CHECKED BY: DM	INITIAL:
DATE: 2018-09-17	
SCALE: AS NOTED	
FILE:	
DRAWING NO: SKA-01	



PRECAST PANEL COMPOSITION:

75mm EXTERIOR PRECAST CONCRETE PANEL
 50mm RIGID INSULATION
 125mm PRECAST CONCRETE BACKUP PANEL

PROJECT:

**UOIT A.C.E. BUILDING EQUIPMENT
 BAY EXPANSION**

UOIT OSHAWA CAMPUS
 60 FOUNDERS DRIVE, OSHAWA ON. L1H 7L7

UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY

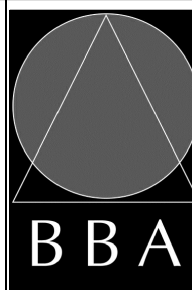
DRAWING:

**EXISTING PRECAST
 CONCRETE PANEL
 COMPOSITION**

DO NOT SCALE THE DRAWINGS
 CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.

ALL DRAWINGS, SPECIFICATIONS AND RELATED DOCUMENTS ARE THE
 COPYRIGHT PROPERTY OF THE CONSULTANT AND MUST BE RETURNED
 UPON REQUEST. REPRODUCTION OF DRAWINGS IN PART OR WHOLE
 WITHOUT THE PERMISSION OF THE CONSULTANT IS FORBIDDEN.

DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED
 AND SEALED BY THE CONSULTANT.



**BARRY BRYAN
 ASSOCIATES**

Architects
 Engineers
 Project Managers

250 Water Street
 Suite 201
 Whitby, Ontario
 L1N 0G5

Tel: (905) 666-5252
 Fax: (905) 666-5256
 e-mail: bba@bba-archeng.com

PROJECT NO:

18033

DESIGN BY:
 BBA

DRAWN BY:
 JJ

CHECKED BY:
 DM

DATE:
 2018-09-20

SCALE:
 1:10

FILE:

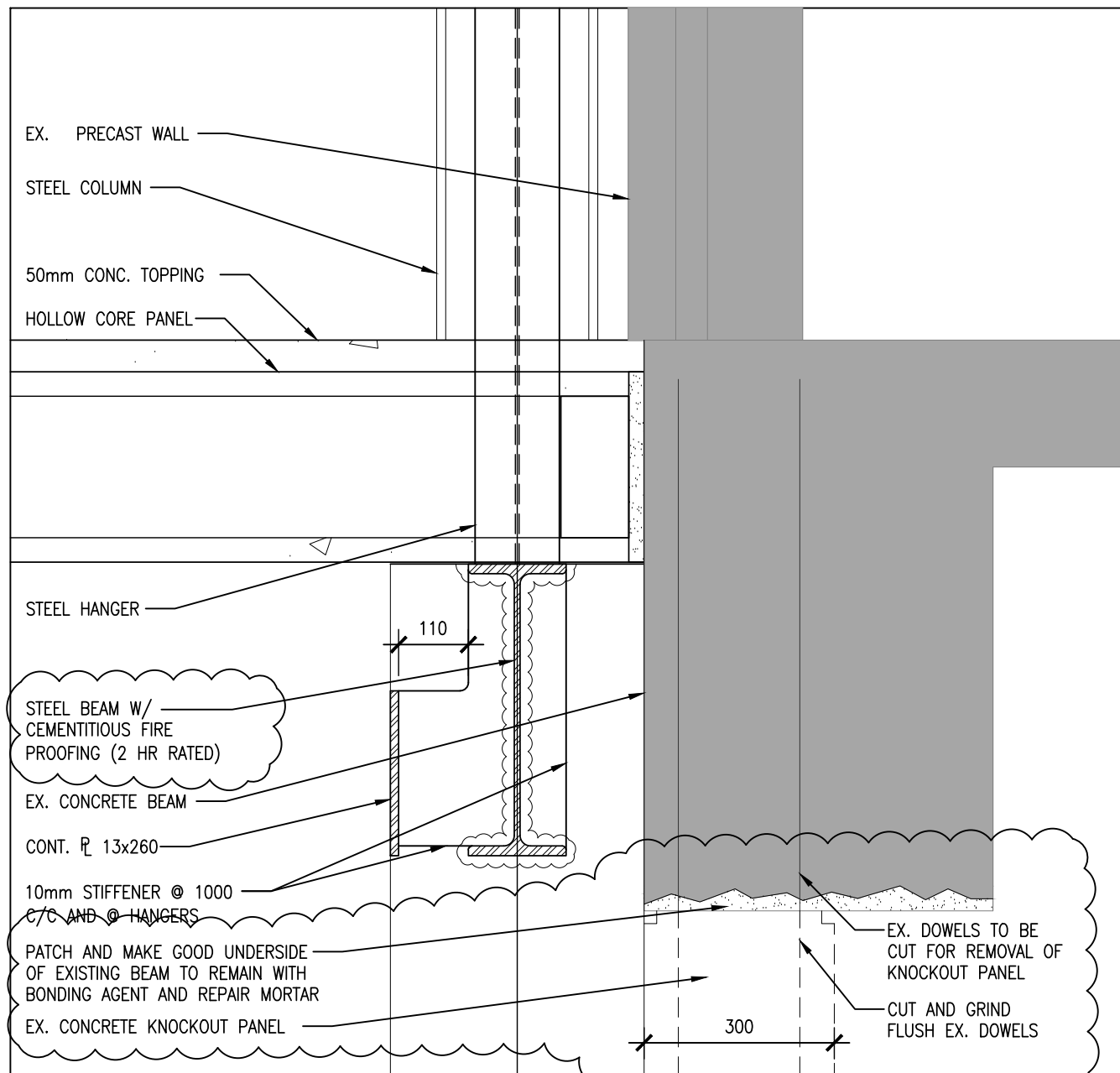
DOC CONTROL:
 DATE

% COMPLETE:

INITIAL:

DRAWING NO:

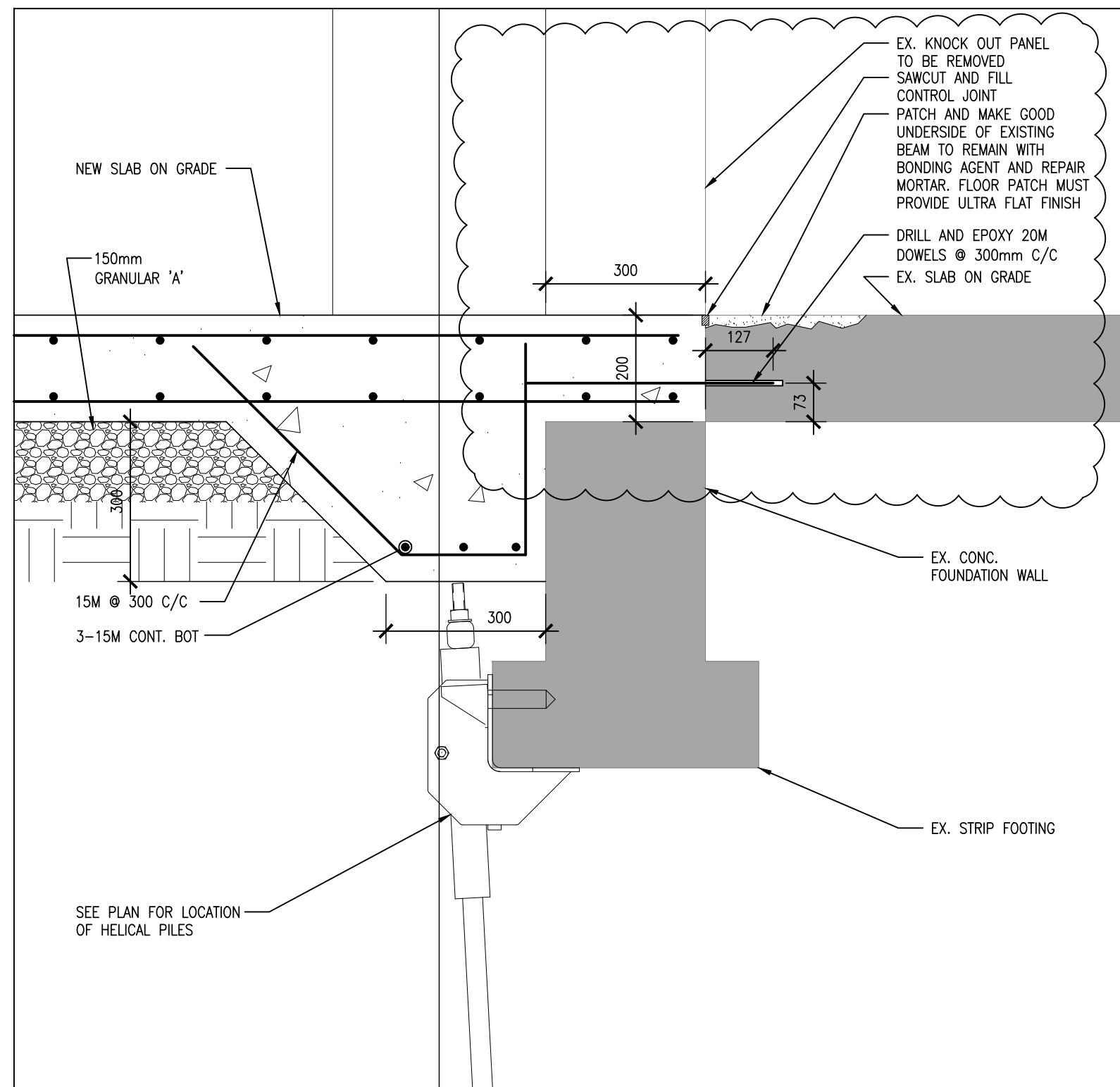
SKA-02



1
S511

FOUNDATION DETAIL

1:10



1
S510

FOUNDATION DETAIL

1:10

PROJECT:

**UOIT A.C.E. BUILDING EQUIPMENT
BAY EXPANSION**

UOIT OSHAWA CAMPUS
60 FOUNDERS DRIVE. OSHAWA ON. L1H 7L7

UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY

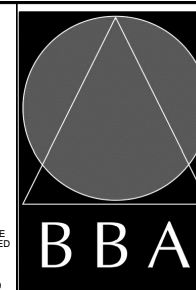
DRAWING:

STRUCTURAL DETAILS

DO NOT SCALE THE DRAWINGS
CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.

ALL DRAWINGS, SPECIFICATIONS AND RELATED DOCUMENTS ARE THE
COPYRIGHT PROPERTY OF THE CONSULTANT AND MUST BE RETURNED
UPON REQUEST. REPRODUCTION OF DRAWINGS IN PART OR WHOLE
WITHOUT THE PERMISSION OF THE CONSULTANT IS FORBIDDEN.

DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED
AND SEALED BY THE CONSULTANT.



**BARRY BRYAN
ASSOCIATES**

Architects
Engineers
Project Managers

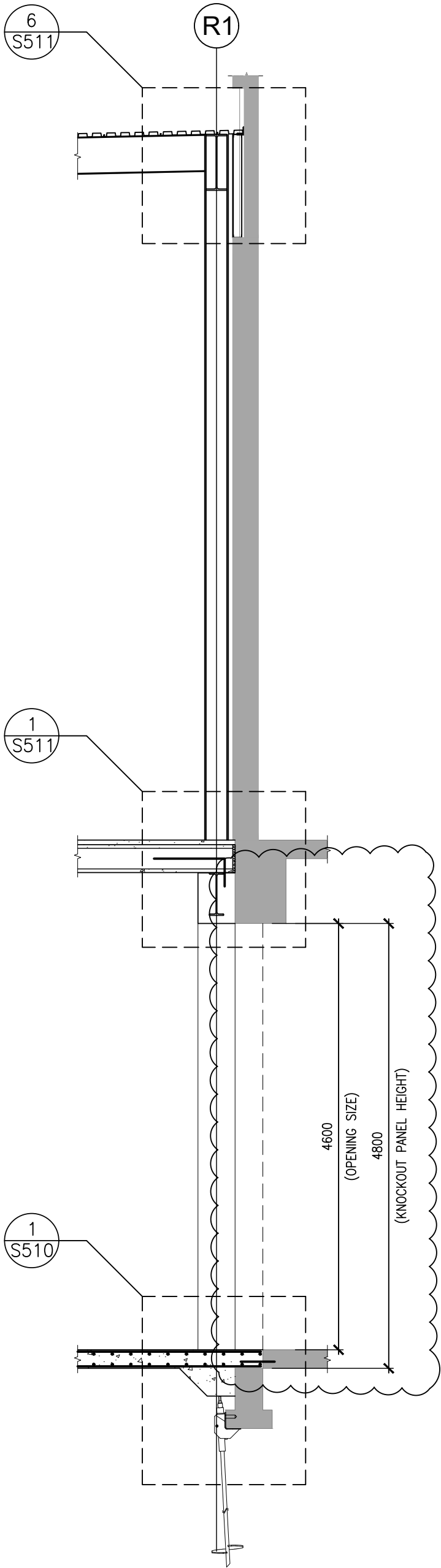
250 Water Street
Suite 201
Whitby, Ontario
L1N 0G5

Tel: (905) 666-5252
Fax: (905) 666-5256
e-mail: bba@bba-archeng.com

PROJECT NO:

18033

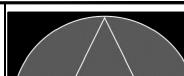
DESIGN BY: DM	DOC CONTROL DATE:
DRAWN BY: JJ	% COMPLETE:
CHECKED BY: DM	INITIAL:
DATE: 2018-09-17	
SCALE: AS NOTED	
FILE:	
DRAWING NO:	
SKS-01	

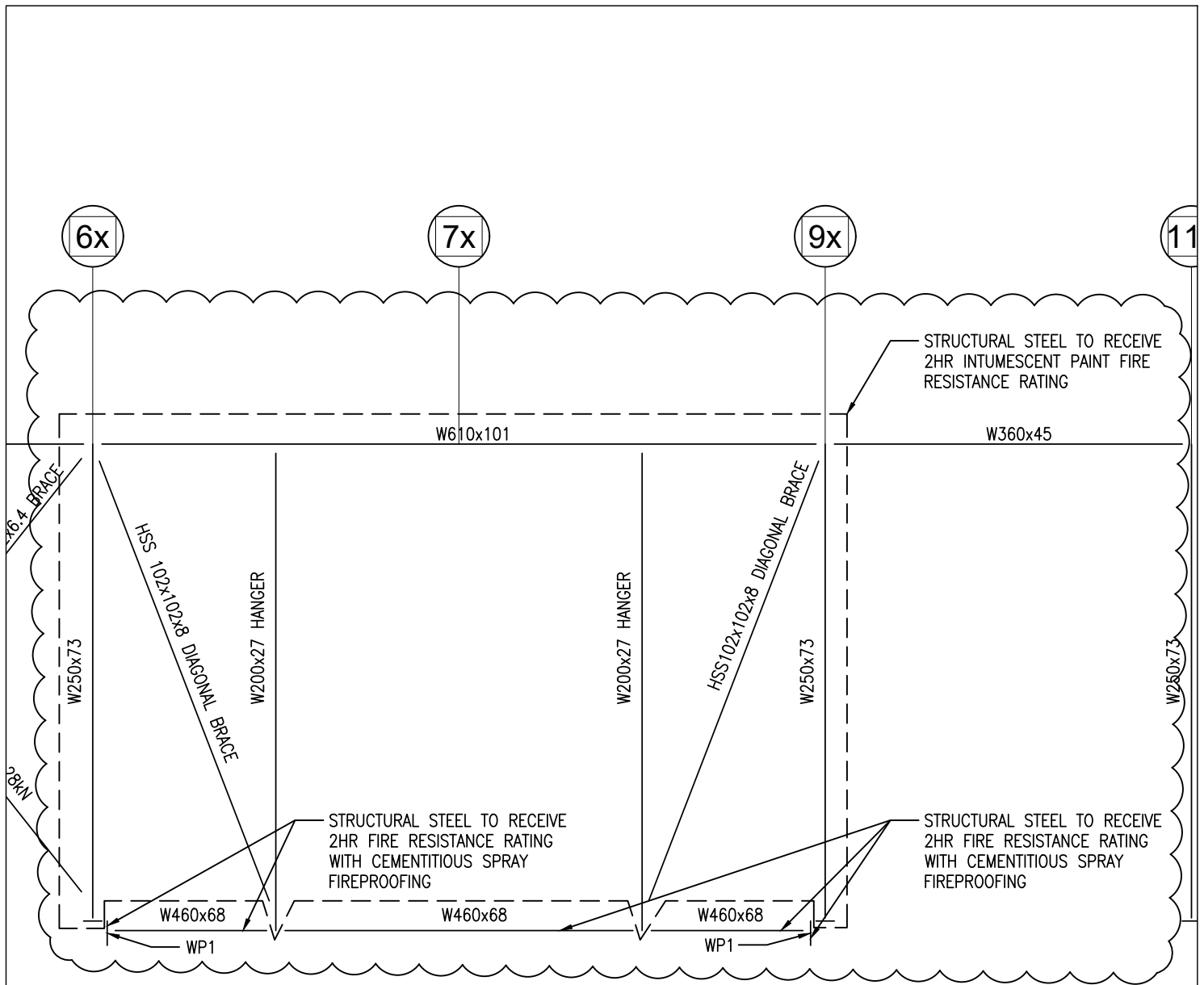


1
S501

WALL SECTION

1:50

<div>PROJECT:</div> <div>UOIT A.C.E. BUILDING EQUIPMENT BAY EXPANSION</div> <div>UOIT OSHAWA CAMPUS 60 FOUNDERS DRIVE. OSHAWA ON. L1H 7L7</div> <div>UNIVERSTIY OF ONTARIO INSTITUTE OF TECHNOLOGY</div>	<div>DRAWING:</div> <div>STRUCTURAL DETAILS</div> <div>DO NOT SCALE THE DRAWINGS CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.</div> <div>ALL DRAWINGS, SPECIFICATIONS AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE CONSULTANT AND MUST BE RETURNED UPON REQUEST. REPRODUCTION OF DRAWINGS IN PART OR WHOLE WITHOUT THE PERMISSION OF THE CONSULTANT IS FORBIDDEN.</div> <div>DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED AND SEALED BY THE CONSULTANT.</div>	<div></div> <div>BARRY BRYAN ASSOCIATES</div> <div>Architects Engineers Project Managers</div> <div>250 Water Street Suite 201 Whitby, Ontario L1N 0G5</div> <div>Tel: (905) 666-5252 Fax: (905) 666-5256 e-mail: bba@bba-archeng.com</div> <div>PROJECT NO: 18033</div>	<table><tr><td>DESIGN BY: DM</td><td>DOC CONTROL: DATE:</td></tr><tr><td>DRAWN BY: JJ</td><td>% COMPLETE:</td></tr><tr><td>CHECKED BY: DM</td><td>INITIAL:</td></tr><tr><td colspan="2">DATE: 2018-09-17</td></tr><tr><td colspan="2">SCALE: AS NOTED</td></tr><tr><td colspan="2">FILE:</td></tr></table> <div>DRAWING NO: SKS-02</div>	DESIGN BY: DM	DOC CONTROL: DATE:	DRAWN BY: JJ	% COMPLETE:	CHECKED BY: DM	INITIAL:	DATE: 2018-09-17		SCALE: AS NOTED		FILE:	
DESIGN BY: DM	DOC CONTROL: DATE:														
DRAWN BY: JJ	% COMPLETE:														
CHECKED BY: DM	INITIAL:														
DATE: 2018-09-17															
SCALE: AS NOTED															
FILE:															



4
S511

(PARTIAL) FRAMING ELEVATION ALONG GL. R1

1:100

PROJECT:

UOIT A.C.E. BUILDING EQUIPMENT BAY EXPANSION

UOIT OSHAWA CAMPUS
60 FOUNDERS DRIVE, OSHAWA ON. L1H 7L7

UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY

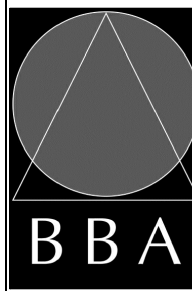
DRAWING:

FRAMING ELEVATION

DO NOT SCALE THE DRAWINGS
CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.

ALL DRAWINGS, SPECIFICATIONS AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE CONSULTANT AND MUST BE RETURNED UPON REQUEST. REPRODUCTION OF DRAWINGS IN PART OR WHOLE WITHOUT THE PERMISSION OF THE CONSULTANT IS FORBIDDEN.

DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED AND SEALED BY THE CONSULTANT.



BARRY BRYAN ASSOCIATES

Architects
Engineers
Project Managers

250 Water Street
Suite 201
Whitby, Ontario
L1N 0G5

Tel: (905) 666-5252
Fax: (905) 666-5256
e-mail: bba@bba-archeng.com

PROJECT NO:

18033

DESIGN BY: DM

DRAWN BY: JJ

CHECKED BY: DM

DATE: 2018-09-17

SCALE: AS NOTED

FILE:

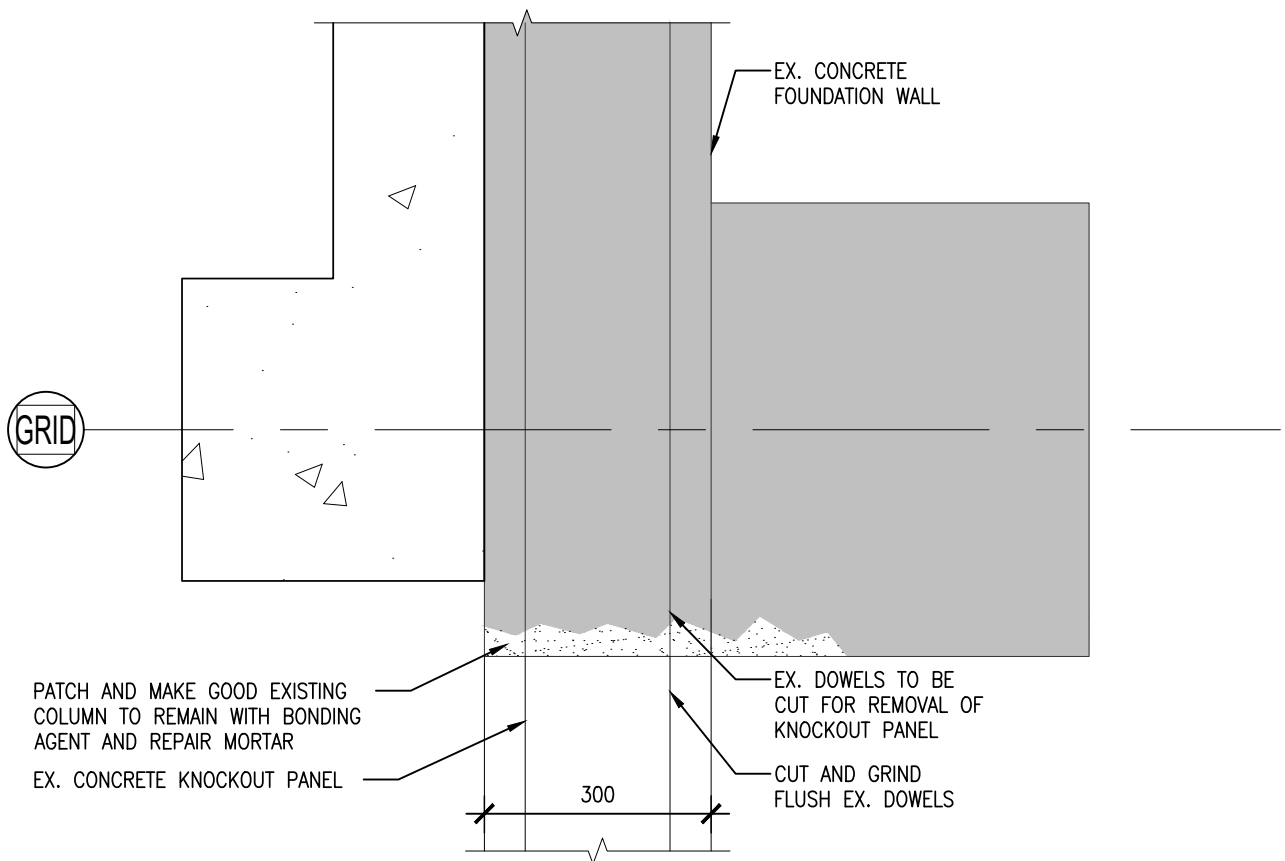
DOC. CONTROL: DATE

% COMPLETE:

INITIAL:

DRAWING NO:

SKS-03



PROJECT:

**UOIT A.C.E. BUILDING EQUIPMENT
BAY EXPANSION**

UOIT OSHAWA CAMPUS
60 FOUNDERS DRIVE, OSHAWA ON. L1H 7L7

UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY

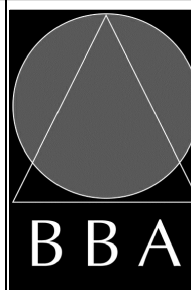
DRAWING:

**KNOCKOUT PANEL
REMOVAL PLAN DETAIL**

DO NOT SCALE THE DRAWINGS
CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.

ALL DRAWINGS, SPECIFICATIONS AND RELATED DOCUMENTS ARE THE
COPYRIGHT PROPERTY OF THE CONSULTANT AND MUST BE RETURNED
UPON REQUEST. REPRODUCTION OF DRAWINGS IN PART OR WHOLE
WITHOUT THE PERMISSION OF THE CONSULTANT IS FORBIDDEN.

DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED
AND SEALED BY THE CONSULTANT.



**BARRY BRYAN
ASSOCIATES**

Architects
Engineers
Project Managers

250 Water Street
Suite 201
Whitby, Ontario
L1N 0G5

Tel: (905) 666-5252
Fax: (905) 666-5256
e-mail: bba@bbae-archeng.com

PROJECT NO:

18033

DESIGN BY:
DM

DRAWN BY:
JJ

CHECKED BY:
DM

DATE:
2018-09-17

SCALE:
1:10

FILE:

DOC. CONTROL:
DATE

% COMPLETE:

INITIAL:

DRAWING NO:

SKS-04

Addendum M-1

DATE: September 18, 2018
PROJECT: UOIT ACE Expansion
PROJECT NO: 210158.000

To: Mr. Doug McLaughlin
Company: Barry Bryan Associates

Email: dmclaughlin@bba-archeng.com

This Addendum forms part of the bid documents and is to be read, interpreted and coordinated with all other parts. The cost of all work contained herein is to be included in the bid submission. The specifications and drawings are complementary. Items listed under the Specifications in this addendum and having influence on the drawings are so deemed to alter the drawings. Items listed under the Drawings in this addendum and having influence on the specifications are so deemed to alter the specifications.

This mechanical addendum consists of the following:

- fifteen (15) type written pages
- one (1) sketches

1. GENERAL

1. Clarify that venting for all plumbing fixtures must be according to the latest Ontario Building Code requirements.
2. Clarify that balancing dampers and valves are required at all terminal points in the HVAC system.
3. Clarify that all terminal hydronic devices (radiators, unit heaters, force flow heaters, VAV boxes with reheat, etc) shall be c/w isolation valves on the water supply and return lines, balancing valves on the return line and thermostatic control valves on the supply line.
4. Include in tender price an additional 5 m2 (50ft2) of supplied and installed fire dampers. Fire separations have been identified on the architectural drawings.
5. Clarify that hot water pipe connection to all terminal hydronic heating devices as listed above shall be 20" unless otherwise noted.
6. Note that the Architect shall have final approval of sprinkler locations. No claims for extras will be reviewed for minor sprinkler revisions or additional heads requested by the Architect or local authority.
7. Mechanical Contractor shall be responsible for producing interference drawings to co-ordinate installation of systems between trades.
8. Clarify that all-housekeeping pads shall be provided by the general contractor for all mechanical equipment. Mechanical contractor to coordinate final locations and details with the general contractor.
9. Clarify that all open-ended ducts shall be c/w bellmouth opening and wire mesh grille.
10. Include in tender price an additional 50 linear ft. of installed sprinkler mains and branches that includes fittings. All drains downs are to be included in the tender price.
11. Clarify that the Fire Protection scope is design build as indicated on the drawings. It is the contractor's responsibility to design, engineer, and construct a code compliant fire protection sprinkler system following the specifications and drawings in the contract documents. All Drawings and hydraulic calculations shall be submitted to the mechanical consultant for review, and shall bear the stamp and signature of a Professional Engineer registered in the Province.
12. Clarify all sprinklers and sprinkler/standpipe piping shown on mechanical drawings are for reference only. The intent is to indicate general placement preference based on predicted layout. Specific placement and number of sprinklers are to be determined based on contractor's submittal. Not all piping and pipe off-sets

are shown on drawings. Number of sprinklers, piping and locations to be determined based on NFPA 13 including all concealed spaces (not necessarily shown on drawings) shown on fire sprinkler contractor's submittal. Prior to any installation and submittal for permit of fire sprinkler system the contractor to submit for approval by the Architect and the Mechanical Engineer.

2. SPECIFICATIONS

2.1 Make-up Air Unit Specification

1. PART 1 - GENERAL

1.1 SUBMITTALS

- 1.1.1 Submit shop drawings and product data.
- 1.1.2 Indicate the following: complete specifications; weight; performance details.
- 1.1.3 Provide data for inclusion in the Operating and Maintenance manuals.

2. PART 2 - PRODUCTS

2.1 GENERAL

- 2.1.1 The following manufacturers are approved in principle subject to meeting the specifications. Manufacturers are responsible for all co-ordination issues arising from dimensional variances between plans and site conditions.

Daikin, Annex Air, TMI, Scott Springfield, Swegon

- 2.1.2 Air handling units shall be ETL-Canada safety listed to conform to UL Standard 1995 and CAN/CSA Standard C22.2 No. 236. Air handling unit water heating & cooling coils shall be certified in accordance with the forced circulation air cooling and air heating coils certification program, which is based on ARI Standard 410.

2.2 CASING

- 2.2.1 Fabricate unit with 16 gauge nominal channel posts and panels secured with mechanical fasteners. All panels and access doors shall be sealed with bulb-type gasket.
- 2.2.2 Panels and access doors shall be constructed as a 2-inch (50-mm) nominal thick, thermal broke double wall assembly, injected with foam insulation for an R-value of not less than R-13. The outer casing shall be constructed of heavy gauge G60 galvanized steel, phosphatized and painted with baked on enamel.
- 2.2.3 The inner liner shall be constructed of G90 galvanized steel. Panel deflection shall not exceed L/240 at 125% of design static pressure, minimum +/- 8". Deflection shall be measured at the midpoint of the panel height.
- 2.2.4 The casing leakage rate shall not exceed 1% of supply air volume at design static pressure up to positive or negative 8 inches.
- 2.2.5 Access doors shall be flush mounted to the cabinetry and secured with heavy-duty stainless steel hinges. The door latch handle assembly shall be provided with a full-size grip handle and roller pall for smooth operation. The assembly shall be gasketed and sealed to prevent thermal bridging. Doors opening with pressure shall include a safety chain and an access tool required to open the compartment.
- 2.2.6 Access doors shall be provided for the outdoor air intake section, between the cooling coil and the fan, fan section, gas burner vestibule, and discharge air plenum section.
- 2.2.7 Construct drain pans from stainless steel with cross break and pitch to drain connection. Provide drain pans under cooling coil section.
- 2.2.8 All outdoor units mounted on roof curbs with openings to the conditioned space below, shall be designed with a drip shield under the unit to catch and remove any potential moisture created by condensation.
- 2.2.9 Provide unit with a factory installed 4 inch high full perimeter channel base rail.

- 2.2.10 Floor plate shall be constructed of G90 galvanized steel.
- 2.3 OUTDOOR AIR INTAKE SECTION
- 2.3.1 Provide outdoor air intake section with a factory mounted low leak airfoil outside air dampers of galvanized steel in galvanized frame. Dampers shall be hollow core airfoil blades, fully gasketed. Provide continuous vinyl seals between damper blades. Provide stainless steel end seals along end of dampers. Provide linkage and ABS plastic end caps provided.
- 2.3.2 Damper leakage rate shall be less than two tenths of one percent leakage at 2 inches static pressure differential. Leakage rate shall be tested in accordance with AMCA Standard 500.
- 2.3.3 Damper actuators are by the BAS contractor.
- 2.4 FILTERS
- 2.4.1 Provide a filter rack in the outdoor air intake section. Provide flat arrangement with 2 inch deep MERV 8 filters.
- 2.4.2 Filter media shall be UL 900 listed, Class I or Class II.
- 2.4.3 Provide Minihelic filter gauges for each filter bank flush mounted into unit casing with factory mounted probes.
- 2.5 FANS
- 2.5.1 Provide direct drive, SWSI, air foil fans as scheduled. Dynamically balance fans before and after installation in fan cabinet section. Ensure maximum fan RPM is below the first critical speed fan.
- 2.5.1.1 Locate fan and motor internally on a steel base. Factory mount motor on a slide base that can be slid out of unit. Provide access to motor, drive and bearings through hinged access door. Provide fan and motor assembly mounted on 2" deflection spring vibration isolators inside cabinet.
- 2.5.2 Provide self-aligning, grease lubricated, ball or roller bearings with extended copper lubrication lines to access side of unit. Provide grease fittings attached to fan base assembly near access door.
- 2.5.3 Provide open drip proof premium efficiency motors. Motors shall be suitable for operation with a VFD
- 2.5.1 Inverter duty rated motors shall be supplied with a factory installed shaft grounding kit. The kit shall consist of brushes or conductive rings with micro fibers which divert unwanted shaft currents away from the bearings to the ground.
- 2.6 COILS
- 2.6.1 Provide access to coils from connection side of unit for service and cleaning. Enclose coil headers and return bends fully within unit casing. Fabricate coil connections, vents and drains to extend beyond unit casing including grommets for an airtight unit casing. Coils shall be removable through side panels and/or top panels of unit without removal and disassembly of entire section.
- 2.6.2 Provide stainless steel drain pan located underneath and extending downstream of coil and intermediate drain pans.
- 2.6.3 Coil performance shall be as per schedule. Coil performance data shall be certified in accordance with ARI Standard 410 where applicable.
- 2.6.4 Construction:
- Tubes: Copper.
- Fins: Aluminum mechanically bonded to tubes.
- Headers: Seamless copper with vent and drain connections.
- Casing: 16 gauge, stainless steel channels with 16 gauge center and end supports.

- 2.6.5 Water cooling and heating coils shall be circuited drainable with a vent connection at the highest point and a drain connection at the lowest point. Coil headers shall be copper with steel male pipe connections.
- 2.6.6 Provide a face-and-bypass damper - low leak, opposed blade, with vinyl bulb edging and stainless steel edge seals, galvanized steel frame and axles in self-lubricating nylon bearings, arranged to match coil face with top bypass. damper for the cooling coil for passive dehumidification. Damper shall be manually adjustable for air flow balancing as defined in the schedule.
- 2.7 GAS HEATING SECTION
- 2.8 Furnish and install a Gas-fired Section. Furnace shall have a minimum thermal efficiency of 80%. The module shall employ tubular heat exchangers with a draft inducer assembly to provide for positive venting of flue gases.
- 2.9 Tubular heat exchanger shall be constructed of 16 gauge, minimum, type 304 stainless tubes, 2 1/4" diameter having a minimum tube wall thickness of .049" and shall be produced to ASTM A249 construction standards for heat exchanger application. Tubes shall employ integral formed-dimple restrictors to eliminate noise associated with expansion and contraction of internal baffles during heating cycles, and to provide for unobstructed drainage of condensate that occurs in the tubes during cooling operation. Drainage shall be configured so that burners and burner surfaces are not exposed to condensate during cooling system operation.
- 2.10 The furnace shall have a single stage a modulating 10% to 100% control system. On a call for heat, the modulating control shall control the firing rate between 10% and 100% of rated capacity. Stepped modulation is not acceptable.
- 2.11 All burners shall include an ignition control, roll out switch and air proving switch. Additionally, on full modulation models a fan relay, delay timer and high fire gas valve control relay shall be included. Burners shall accept either 0 to 10vDC or 4 to 20ma input signals (signal provided by others).
- 2.12 CONTROLS
- 2.12.1 All unit controls and associated wiring is by the BAS contractor.
- 2.13 UNIT ELECTRICAL
- 2.13.1 Provide factory mounted and wired starters for each fan motor. Each starter shall have a Hand-OFF-Auto control switch, thermal overload and disconnect switch.
- 2.13.2 Fan arrays shall be wired to a single source motor control panel with short circuit protection and non fused disconnect factory wired from the panel to the motors. McQuay variable speed drives with (1 VFD for each fan) shall be factory installed. Fan ON-OFF and speed control shall be supplied and installed by others.
- 2.13.3 Unit manufacturer shall provide wiring from each fan motor to a VFD and disconnect.
3. PART 3-EXECUTION
- 3.1 INSTALLATION
- 3.1.1 Install unit flat and level on house keeping pad and in accordance with manufacturer's installation literature.
- 3.1.2 Provide piping connections to coils such that individual coils can be isolated, drained and removed. Provide valved pressure gauge connections and thermometer wells on the entering and leaving piping.
- 3.1.3 Provide valved drain connections with hose end, cap and chain for all coils.
- 3.1.4 Size and install the furnace venting according to manufacturer recommendations and local codes.
- 3.1.5 Pipe all drain pan connections the nearest floor drain with appropriately sized trap.

END OF SECTION

2.2 Fan Coil Unit Specification

PART 1 – GENERAL

SUBMITTALS

Submit shop drawings and product data.

Indicate the following: complete specifications; weight; performance details.

Provide data for inclusion in the Operating and Maintenance manuals.

PART 2 - PRODUCTS

GENERAL

Units shall be manufactured by International Environmental Corp. (IEC) as described herein.

Units shall be listed by Electronics Testing Laboratories, Inc. with the ETL listing indicating the units comply with the minimum requirements of the Canadian national product safety standard, UL 1995/CSA C22.2 No. 236

Elastomeric Closed Cell Foam Insulation shall conform to NFPA 90A for fire, smoke and melting; UL 181 for erosion; 25/50 rating for flame spread/smoke developed per ASTM E-84, UL 723 and NFPA 90A; antimicrobial performance rating of 0, no observed growth, per ASTM G-21

CASING

Provide horizontal hideaway type fan coils manufactured from heavy gauge galvanized steel. Horizontal units shall be designed to be ceiling hung. The interior surfaces shall be lined with 1/2" thick standard fiberglass insulation. Units shall be supplied with a ducted collar for supply duct connection. Filter shall be 2" MERV13 type.

FANS AND MOTORS

Belt drive units shall have DWDI forward curved fans. Motors shall be ODP type. Provide V belt drive with adjustable motor mount for belt tension and variable pitch motor sheave.

Motor starters and unit disconnect are by the electrical contractor.

COILS

Coils shall be tested in accordance with AHRI.

Fan coils shall have aluminum fin, copper tube coils with manual air vents. Provide each unit with a drain pan fabricated of continuous stainless steel.

All coils shall be leak tested with air at 300 psig under water and designed for operating pressures of 250 psig.

CONTROLS AND VALVES

Thermostats are by the BAS contractor

All units shall be operated using 3-way valves furnished and installed by the BAS contractor.

PART 3 - EXECUTION

INSTALLATION

Install fan coils in accordance with manufacturer's installation and maintenance instructions.

Provide isolation valves and unions for each fan coil.

END OF SECTION

2.3 Heat Pump Specification

GENERAL SUBMITTALS

Submit shop drawings and product data.

Indicate the following: complete specifications; wiring diagrams (showing all interconnections); weight; performance details.

Provide data for inclusion in the Operating and Maintenance manuals.

PRODUCTS

GENERAL

Air-cooled chiller shall be AERMEC (supplied by HTS Engineering) with CSA or cETL approval. Chillers shall be factory run-tested and shipped with a full charge of R-410A refrigerant.

The unit shall meet the performance data as detailed in the schedule. Construction and ratings shall be in accordance with latest ARI Standard 590, ANSI/ASHRAE 15, CSA-B52 and ASME Code.

All listed acceptable chiller manufacturers must be able to provide tested and catalogued data detailing unit performance under all specified chiller operating modes. All chillers shall be run tested at the factory prior to shipment to site.

CABINET

The unit shall be assembled on a rugged heavy gauge steel base not requiring field supplied structural steel support.

Exterior casing shall be cleaned and phosphatized, then coated with a polyester powder paint.

Unit shall have easily removable, separate access panels to the control centre and the compressor compartment. Top panel and condenser fan deck assemblies shall be removable.

EVAPORATOR

Each evaporator / heat exchanger shall be a brazed plate-to-plate type heat exchanger with 316 stainless steel plates. Each heat exchanger shall have two independent refrigerant circuits on the refrigerant side, and one circuit on the water side.

The heat exchanger shall be protected with an electric resistance heater and insulated with a thick closed-cell polyurethane insulation, providing freeze protection down to -20°F (-29°C) ambient air temperature.

CONDENSER

Condenser coils shall be constructed from seamless copper tubes mechanically expanded into aluminum fins and shall have integral subcooling circuits.

Condenser fans shall be axial or helical type, aerodynamically designed for ultra-low noise level generation. Motors shall be weather protected, three-phase, with permanently lubricated ball bearings. Motors safeties shall include magnetic circuit breakers.

Provide metal fan guards to guard against moving parts.

Unit shall be provided with automatic head pressure control to permit operation at ambient air temperatures down to 0° F by cycling the condenser fans and controlling a variable speed fan in response to head pressure and ambient temperature.

COMPRESSORS

The compressors shall be sealed hermetic, scroll type with crankcase oil heater and suction strainer. The compressor motor shall be refrigerant gas cooled, high torque, hermetic induction type, two-pole, with inherent thermal protection on all three phases and shall be mounted on RIS vibration isolator pads.

Provide units with a sound package where the compressors are mounted inside an acoustically treated and insulated compartment. Do not exceed sound data published in the performance schedules.

REFRIGERANT CIRCUIT

All units shall have independent refrigerant circuits with single or multiple compressors in tandem per circuit for optimal staging and load control. Single circuited units will not be accepted.

Each circuit shall include a refrigerant filter-drier, sight glass with moisture indicator, liquid line solenoid valve, expansion valve, high and low pressure safeties, and insulated suction line. High pressure safeties shall require a manual reset.

The unit shall include a reversing flow valve for heat pump operation with performance as described in the performance schedules.

ELECTRICAL

A centrally located weatherproof control panel shall contain the unit control system, control interlock terminals and field-power connection points. Hinged control panel access doors shall be tool-lockable. Barrier panels shall be provided to protect against accidental contact with line voltage when accessing the control system.

Power and starting components shall include: individual contactors and circuit breakers for fan motors, circuit breakers and factory mounted transformers for each control-circuit, unit power terminal blocks for connection to remote disconnect switch, and terminals for power supply to the evaporator heater circuit. Fan motors shall have inherent overload protection and compressor motors shall have three-phase motor overload protection.

Chiller shall be supplied with factory installed non fused disconnect.

CONTROL SYSTEM

Unit shall be equipped with a standalone DDC microprocessor based control system. The control logic shall be designed to maximize operating efficiency and equipment life with protections for operation under unusual conditions and to provide a history of operating conditions. The system shall intelligently stage the unit to sustain leaving water temperature precision and stability while minimizing compressor cycling.

The DDC controller shall support the following safety and operating controls: high pressure switches for each refrigerant circuit; loss of flow in the evaporator water circuit; condenser fan staging by head pressure; digital setting of low evaporator water temperature cutout, high pressure cutout, suction pressure cutout, and freeze protection cutout; compressor soft loading; demand limit control based on 4-20 mA DC signal input; automatic circuit lead/lag based on fewest operating hours (with manual override); chilled water reset based on (an externally applied 4-20 mA signal).

The keypad/display shall provide access to all vital equipment data. Data shall include full description of current unit status, set point parameters, and alarms. Programmable security password protection shall be provided.

Control system shall: continuously perform self diagnostic checks; monitor all system temperatures, pressures and safeties; and shall automatically shut down a compressor, refrigerant circuit or entire unit should a fault occur. Diagnostic function shall provide operator with a pre-alarm status indication allowing time to take corrective action prior to a safety shutdown.

The DDC controller shall be equipped with a time clock to allow the user to program a daily / weekly schedule.

Controller shall provide output contact closure for control of chilled water pump.

The controller shall support an RS-485 network communications trunk.

The chiller shall be capable of communications with any Building Automation System supporting BACnet, Modbus and LONMark communications protocol. The information communicated between the BAS and the factory mounted unit controllers shall include the reading and writing of data to allow unit monitoring, control and alarm notification as specified in the unit sequence of operation and the unit points list.

STARTUP SERVICE AND WARRANTY

Manufacturer shall furnish a factory trained service technician to perform the unit startup. Manufacturer shall provide instruction of the owner's personnel on the operation and maintenance of the unit. The warranty period shall commence at the date of initial startup and shall continue for a period of one (1) year not to exceed eighteen (18) months from shipment. Manufacturer's warranty shall include all parts and labor to install parts.

EXECUTION

INSTALLATION

Install units on a flat surface level within 1/8 inch and of sufficient strength to support concentrated loading with isolation spring assemblies under the units.

Provide components furnished as per manufacturer's literature.

Provide all water piping so unit and water circuits are serviceable, without having to dismantle excessive lengths of pipe.

Provide valves in water piping upstream and downstream of the evaporator water connections for isolating the shells and to balance the system.

Install flow sensors in water piping where noted above.

Provide strainers ahead of all pumps and automatic modulating valves.

Provide certified wiring schematics to the electrical division for the chiller, associated equipment and controls.

END OF SECTION

2.4 Sequences of Operation

1 General

1.1 Summary

1.1.1 Section Includes:

1.1.1.1 A detailed narrative description of Sequence of Operation of each system

1.2 Sequence of operations

1.2.1 Heat Pump (HP-1)

1.2.1.1 Air to water chiller/heat pump use Hydronic's in conjunction with refrigerant to provide heating and/or cooling. The user selects a water temperature set point they desire using the on board or remote controller and the heat pump unit operates to meet this setting. In cooling this temperature may be between 39°F and 64°F while in heating the range is between 68°F and 131°F. In heat pump mode. The unit can be started with water as low as 39°F (4°C) and with lower temperature with glycol in the system. The unit will start and if the water volume in the system is correct it will bring the temperature up to above 68F or 20C within approximately 15 minutes. You could see up to three pre-alarms during this time. If the system cannot get up to the required minimum temperature after that it will lock out and need to be reset on full alarm. If the system water volume is very large a bypass is suggested in order to let the unit warm up the water in steps. Do not reset full alarm more than once without checking to see if compressor is running in reverse, or other possible issues.

1.2.1.2 For Defrost we must reach a low pressure minimum value to enter into possible defrost mode. Only when the low pressure is below 61 PSI can we possibly go into defrost. If the pressure is above 61 PSI we have no chance of needing defrost. Only after the pressure drops below 61 PSI for more than 10 minutes will we enter on possible defrost situation. If we reach these two conditions we can have a defrost minimum every 30 minutes according to this parameter. The logic states that after 5 minutes of compressor operation we read the low pressure and write it to memory inside the controller, this becomes fixed value A. After that if the low pressure drops more than 8.7 PSI below the fixed value A, we can have defrost. The defrost is accomplished by reversing the cycle. The t t sbr parameter is the delay time between two defrosts which is 1800 seconds.

1.2.2 Maintenance Room MUA-1, Exhaust Fan (EF-1), Car Exhaust Extraction (EF-2 & 3), Motorized Dampers and Gas detection systems.

1.2.2.1 This system consists of a 100% outside air supply unit, exhaust fans and a carbon monoxide/nitrogen dioxide detection system. Also present in the area are exhaust hose reels with fan (EF-2 and 3) that automatically activates upon removal of the hose from the reel (for connection to an exhaust pipe).

- 1.2.2.2 Exhaust fan (EF-1) shall be hard wire interlocked to the respective supply air fans (MUA-1) and to the carbon monoxide/nitrogen dioxide detection system. Hose reel exhaust fan (EF-2 and EF-3) shall be connected to the BMS for status. If the hose reel exhaust fan is activated then (EF-1) exhaust fan's speed shall be calculated by the BMS to allow for a reduction in exhaust requirement due to the hose reel fan volume (fan tracking). Alarm shall be indicated at BMS. Provide system status to BMS.
- 1.2.2.3 MUA-1 shall provide the minimum outdoor air required to satisfy ASHRAE requirements and thus distribute the outdoor air indirectly to the back of fan coils (FC-1 &2). The fan coils will recirculate the air in the basement and ground floor Maintenance Areas.
- 1.2.2.3.1 The unit will operate on a time of day schedule as determined by the Owner.
- 1.2.2.3.2 When the unit is off, the supply fan and the exhaust fans shall be off and the outside and exhaust air dampers are fully closed.
- 1.2.2.3.3 The air handling unit will consist of a supply fan, glycol hot/chilled water coil and 3-way control valve.
- 1.2.2.3.4 A temperature controller, with its sensing element located in the supply air, shall modulate in sequence with the heating coil and the cooling coil valves to maintain the adjustable set point of 70°F (21°C) in summer and 55°F (13°C) in winter. Provide two stages of heat control based on outdoor air temperature reading.
- 1.2.2.3.5 Upon signal from the fire alarm panel the supply fan and exhaust fans shall be shut off.
- 1.2.2.3.6 In the event of a low temperature 4.5°C (40.0°F) occurring in the supply air as sensed by a freezestat or a high temperature condition 60.0°C (140.0°F) occurring in the supply air as sensed by a fire stat, the supply air and return air fans shall shut down and an alarm condition shall occur at the BMS.
- 1.2.2.3.7 Freeze stats and fire stats shall require manual reset before normal operation can be resumed.
- 1.2.2.3.8 Provide zone space temperature, discharge air temperature and relative humidity indication at the BMS.
- 1.2.2.3.9 Heat pump (HP-1) shall be primary source of heat to outside air temperature of 25°F (-4°C). When temperature falls below MUA-1 gas burner to energize.
- 1.2.3 Fan Coil Units**
- 1.2.1 Space thermostat shall sequence the 3-way heating/cooling control valve to maintain space temperature at user defined setpoint.
- 1.2.2 The heat pump will enable heating/cooling modes based on outdoor air temperatures and active setpoints within the space.
- 1.2.3 All units to be monitored by existing BMS for status and room temperature.
- 1.2.4 Electric Force Flow Heaters**
- 1.2.4.1 Provide a line voltage electronic thermostat to cycle the unit on to maintain user defined set point.
- 1.2.5 Gas Fired Unit Heaters**
- UH-1**
- 1.2.5.1 Provide a line voltage electronic thermostat to cycle the unit on to maintain set point.
- 1.2.5.2 Unit heater will be enabled to operate providing the OAT is below 55°F (12°C). If the OAT is above 57.2°F (14°C) the Unit heaters will be disabled.

- 1.2.5.3 When the OAT is below 55°F (12°C)
- 1.2.5.4 The unit heater will turn on when the associated overhead door is open and remain on for 5 minutes.
- 1.2.5.5 After 5 minutes the unit heater will remain on if the associated zone temperature from the local Fan Coil Unit is below set point, otherwise the unit heater will turn off.
- 1.2.5.6 When the associated overhead door is closed, the unit heater will turn off after 2 minutes if set point has not been reached.

UH-2 to UH-5

- 1.2.5.7 Provide a line voltage electronic thermostat to cycle the unit on to maintain user defined set point.

2 Products

- 2.1 Not used
- 2.1.1 Not Used.

3 Execution

- 3.1 Not used
- 3.1.1 Not Used.

End of Section

3. DRAWINGS**3.1 M103 - Mechanical Details**

- .1 Add detail no.10 to clarify valving arrangement for fan coil and make up air unit coil connections. See attached detail.

APPENDIX "A"
MECHANICAL CHECKLIST FOR SUBSTANTIAL COMPLETION

Date: _____

Project No: _____

Project Name: _____

Mechanical Contractor: _____

Contractor is to initial all items that have been completed and email checklist back to Integral Group 48 hours prior to final review. For any items that are not applicable to your project, please mark "N/A" in the right side column.

1. GENERAL

- | | |
|--|-------|
| 1. Maintenance Manuals submitted to Consultant for review. | _____ |
| 2. Letter of Completion from control sub-trade forwarded and documentation forwarded. | _____ |
| 3. All certification, test and inspection certificates submitted (refer to requirements at the end of this checklist). | _____ |
| 4. Record Drawings completed, checked and submitted for mechanical and plumbing. | _____ |
| 5. Record Drawings completed, checked and submitted for fire protection. | _____ |
| 6. Record Drawings completed, checked and submitted for heat reclaim system. | _____ |
| 7. Confirm program for warranty period, including site visits and assistance to Owners for operations and maintenance and controls. Extended warranty forms completed. | _____ |
| 8. Performance tests carried out. | _____ |
| 9. Cleanup completed (air filters, strainers, etc.). | _____ |
| 10. Confirm access to components (valves, dampers, etc.). | _____ |
| 11. Thermometers, pressure gauges and filter gauges in place. | _____ |
| 12. Flexible connections and isolators free from binding. | _____ |
| 13. Painting, identification and valve tagging completed. | _____ |
| 14. Equipment lubricated and accessible for maintenance. | _____ |
| 15. Balancing completed or nearing completion. | _____ |
| 16. Vibration and sound control checked. | _____ |
| 17. Insulation repaired and proper finish applied including BCICA Quality Assurance Certificate Submission. | _____ |
| 18. Pipe, duct and equipment identification completed. | _____ |
| 19. Firestopping completed. | _____ |

2. PLUMBING

- | | |
|--|-------|
| 1. All backflow preventers installed and functioning. | _____ |
| 2. Plumbing fixtures cleaned and water flows adjusted. | _____ |

3. Proper access to all cleanouts confirmed. _____
4. Confirm that roof and floor drains are located at low points. _____
5. Equipment drains taken to hub or funnel drain. _____
6. Expansion and contraction provisions satisfactory. _____
7. Domestic hot water system functioning properly. _____
8. Equipment and units isolated and provided with union or flanges. _____
9. Thermometers and gauges installed. _____
10. Gas connections to all equipment completed and inspected. _____

3. FIRE PROTECTION AND LIFE SAFETY SYSTEMS

1. Sprinkler systems tested and inspected as per NFPA 13. _____
2. Standpipe systems tested and inspected as per NFPA 14. _____
3. Fire protection extinguishers installed. _____
4. Spare sprinklers and cabinet provided. _____

4. HOT WATER HEATING/HYDRONIC SYSTEMS

1. Chemical cleaned piping and treatment charged. _____
2. Expansion tank charged. _____
3. Terminal units operating. _____
4. Radiant panels have clearance for expansion and insulation backing installed. _____
5. Heating coils operating. _____
6. Element fins combed and cleaned. _____
7. Pumps running smoothly. _____
8. Boiler test fired and results submitted. _____

5. VENTILATION SYSTEMS

1. Air handling equipment installed and commissioned. _____
2. Equipment controls commissioned and tested. _____
3. Ductwork and plenums cleaned. _____
4. Air outlets adjusted. _____
5. Clean air filters provided. _____
6. Ductwork noises eliminated. _____
7. Balancing dampers installed. _____
8. Fire dampers installed and tested. _____
9. Drive pulley adjusted for design conditions. _____
10. Cooling coil condensate drains installed. _____

6. ROOFTOP HVAC EQUIPMENT

1. Shipping blocks removed. _____
2. Sound levels confirmed as satisfactory. _____

3. Start-up reports completed. _____
4. Controls check out and operate properly. _____
5. Traps installed on condensate drains. _____
6. Thermostats mounted and programmed. _____
7. Roof-mounted exhaust fans secured on bases. _____

7. DDC/CONTROLS SYSTEMS

1. Panel layout sheets complete with point name, point address and wire identification number. One copy attached to each respective panel door. _____
2. All points tagged with point name, point address and panel number. _____
3. "As-built" control drawings submitted. _____
4. "As-built" program flowcharts submitted. _____
5. "As-built" ladder wiring diagrams showing all hardware interlocks submitted. _____
6. Complete Operator's Manual submitted (including apparatus and Maintenance Manual for all sensors, transducers, solid state relays, etc.). _____
7. Turnover seminar and instructions to Owner completed. _____

CERTIFICATES AND LETTERS OF CERTIFICATION ARE REQUIRED FOR THE FOLLOWING:

[Copies to be faxed to Integral Group (866-365-5539) and included in the Maintenance Manual as per Section 23 05 00.]

1. Plumbing, piping test certificates (water, sanitary and storm). _____
2. Gas piping tests and certifications inspections from Gas Safety Branch and/or gas fitters form letter. _____
3. Sprinkler system certification from the Sprinkler Engineer confirming system installation to NFPA 13 with seal. _____
4. Contractors Material and Test Certificates for above-ground and below ground piping for sprinkler system. _____
5. Verification of proper operation and indication of sprinkler system components on fire alarm panel. _____
6. WHMIS requirements completed. _____
7. Heating system pressure test certificates of installation. _____
8. Report on Chemical Treatment, glycol charging and test results submitted. _____
9. Backflow preventer test certificates. _____
10. Boiler start-up and combustion tests. _____
11. Sealed certification from Vibration Isolation Agent for proper adjustment of spring curbs. _____
12. Performance and start-up testing of heat reclaim system and certificate confirming installation in accordance with Manufacturer's recommendations. _____
13. Start-up reports for each piece of refrigeration equipment and chiller. _____
14. Letter of Completion from control sub-trade, including: _____
 1. Seven day acceptance testing of control system completed.
 2. Control calibration check sheets.
 3. Confirmation of proper control and sequencing of components.
 4. Control system "as-built" with setpoints.
 5. Items under DDC system below.

Date Returned to Integral Group: _____

Submitted By: _____

Signed By: _____

**DOCUMENTATION REQUIRED FOR
MECHANICAL SUBSTANTIAL
COMPLETION**

The following documents, or copies of, are to be submitted for release of the substantial completion of the project and release of Integral Group documentation. These documents are to be submitted 48 hours prior to the Consultant walkthrough.

The following must be submitted and cannot be accepted as a deficiency:

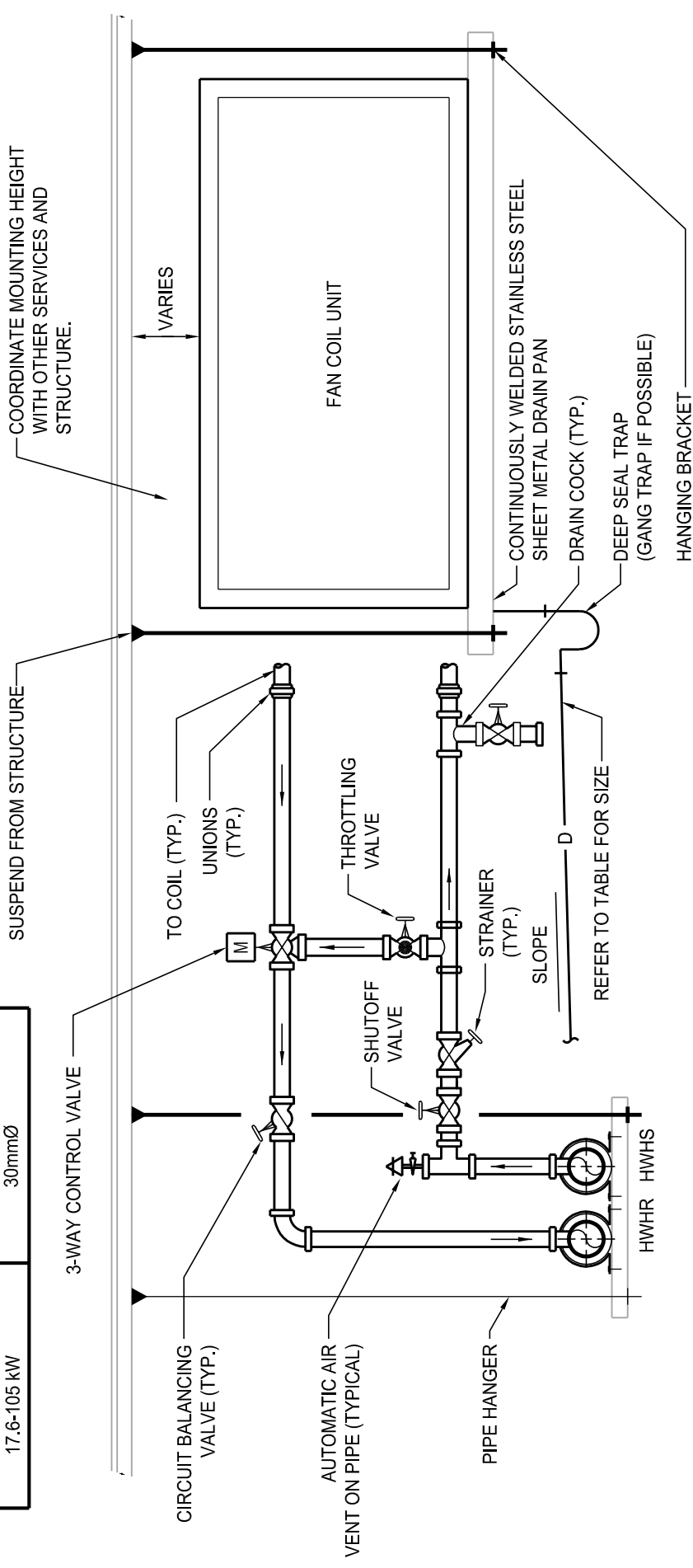
- ☐ Sprinkler Verification Letter.
- ☐ Commissioning Report.
- ☐ Fire Alarm Verification Report.
- ☐ Fire Damper Test Letter from Contractor.
- ☐ Municipal/City Plumbing Final Certificate.
- ☐ Provincial Gas Inspection Certificate or sign off letter from gas fitter.
- ☐ Firestop Shop Drawings and Material Data Sheet Submission.
- ☐ Certificate for Chlorination of Domestic Water Systems.

The following items are to be submitted, but can be held as a deficiency and payment will be withheld until submissions are complete:

- ☐ HVAC Air Balancing Report.
- ☐ Water Balancing Report of Hydronic Systems
- ☐ Shop drawings for all mechanical equipment.
- ☐ Refrigeration Contractor Certification Letter.
- ☐ Material Test Certificates.
- ☐ Warranty Letter from Mechanical Contractor for Warranty period.
- ☐ Operation and Maintenance Manuals.
- ☐ As-built record drawings.
- ☐ Photographs taken during construction and for underground services/concealed piping.

END OF MECHANICAL ADDENDUM NO. 1

FAN COIL COOLING CAPACITY	CONDENSATE DRAIN PIPE SIZE
0-7 kW	18mmØ
7.1-17.5kW	25mmØ
17.6-105 kW	30mmØ



NOTES:
 - TAKE BRANCH PIPES TO FAN COIL UNITS OFF TOP OF MAIN RUNS

FAN COIL/MUA UNIT INSTALLATION DETAIL WITH THREE WAY CONTROL VALVES

10
 M103

SCALE NTS



Electrical Addendum E-01

DATE: September 18, 2018
PROJECT: Ace Base Building Design Services
PROJECT NO: 210158.000

To: Jonathan Jealouse
Company: Barry Bryan Associates
Address: 201-250 Water Street
Whitby, Ont

Email: jjealouse@bba-archeng.com

This Addendum forms part of the Contract documents and is to be read, interpreted and coordinated with all other parts. The cost of all work contained herein is to be included in the Contract Sum. The following revisions supersede the information contained in the original drawings and specifications issued for the above named project to the extent referenced and shall become part thereof.

This Addendum contains 1 typed summary page and 2 drawing pages, for a total of 3 pages.

The following items form part of the Scope of Work:

1. DRAWINGS:

1.1. Drawing E003 – Electrical Singleline Diagram.

- a. Added power connection for new sliding door as indicated on drawing. Final power requirements to be coordinated with door supplier prior to rough-in.
- b. Updated key notes as indicated on drawing.

1.2. Drawing E-101 – Garage Power and Systems Layout.

- a. Added power/ controls for new sliding door as indicated on drawing. Final power requirements to be coordinated with door supplier prior to rough-in.
- b. Updated key notes as indicated on drawing.

END OF ADDENDUM E-01

DO NOT SCALE THE DRAWINGS
CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.
THESE DRAWINGS ARE THE PROPERTY OF INTEGRAL GROUP INC. AND ARE NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT THE PERMISSION OF THE CONSULTING ENGINEER.

UNIVERSITY OF ONTARIO
INSTITUTE OF TECHNOLOGY

NO.	ISSUES	DATE	BY
1	100% DESIGN DEVELOPMENT	18/05/18	
2	ISSUED FOR TENDER & PERMIT	18/07/18	

INTEGRAL GROUP
1000 KENNEDY RD. #100
SCARBOROUGH, ONTARIO M1T 3G5
TEL: (416) 291-1111
WWW.INTEGRALGROUP.COM

PROJECT:
**ACE BASE BUILDING
DESIGN SERVICES**
10101 OSHAWA CAMPUS
80 FOUNDERS DRIVE
OSHAWA ON L1H 7L7
UNIVERSITY OF ONTARIO
INSTITUTE OF TECHNOLOGY

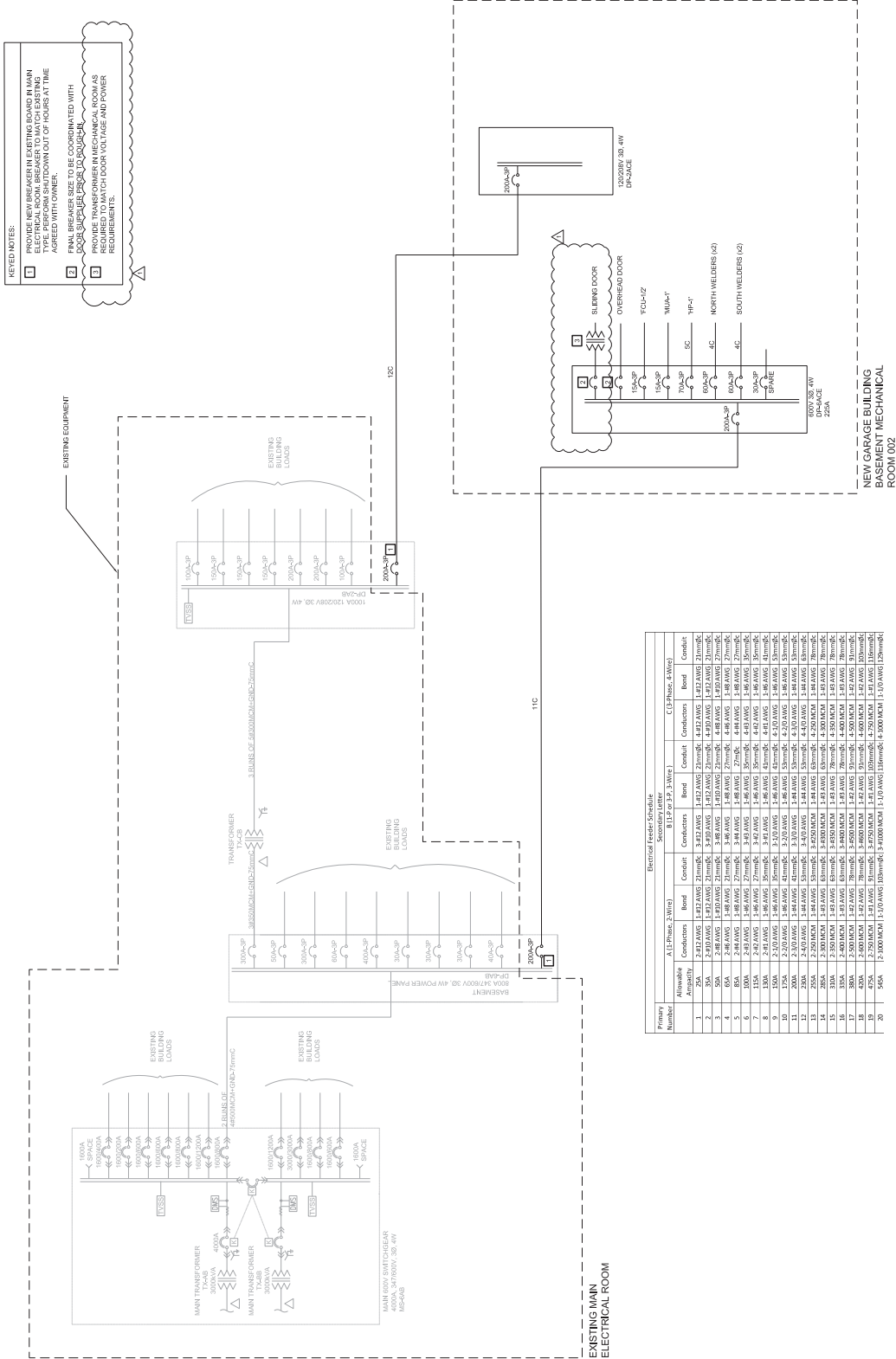
DRAWING:
**ELECTRICAL SINGLE LINE
DIAGRAM**

BBA

**BARRY BRYAN
ASSOCIATES**
Electrical Engineering
Project Manager
1000 Kennedy Road, Suite 201
Scarborough, Ontario M1T 3G5
Tel: (416) 291-1111
Fax: (416) 291-1112
www.barrybryan.com

DATE: AUGUST 2018
SCALE: N.T.S.
FILE: 18033

PROJECT NO: 18033
DRAWING NO: E003





- | LOAD TOTALS | | REMARKS: | DEMAND |
|-------------|----------|------------------|----------------------|
| PHASE A | 16.0 KVA | | |
| PHASE B | 17.2 KVA | | LIGHTING 5.7 KVA |
| PHASE C | 22.9 KVA | | RECEPTACLES 11.6 KVA |
| | | DIVERSITY FACTOR | MOTORS 3.0 KVA |
| | | | OTHERS 0.0 KVA |
| | | 1 | |
| | 5.7 KVA | | |
| | 23.2 KVA | 0.5 | |
| | | | TOTAL POWER 33.3 KVA |
| | 3.9 KVA | 0.75 | |
| | | | TOTAL CURRENT 60.3 A |
| | 0.6 KVA | 1 | |



V. A. WOOD ASSOCIATES LIMITED

CONSULTING GEOTECHNICAL ENGINEERS

1080 TAPSCOTT ROAD, UNIT 24, SCARBOROUGH, ONTARIO M1X 1E7

TELEPHONE: (416) 292-2868 • FAX No: (416) 292-5375

***GEOTECHNICAL INVESTIGATION
ACE BUILDING ADDITION
UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY
2000 SIMCOE STREET NORTH
OSHAWA, ONTARIO***

Ref. No. 3890-ACE-18-3

May 2018

Prepared for:

*University of Ontario Institute of Technology
2000 Simcoe Street North
Oshawa, Ontario
L1H 7K4*

CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
2.0 FIELD WORK	2
3.0 SUBSURFACE CONDITIONS	3
4.0 GROUNDWATER CONDITIONS	7
5.0 DISCUSSION AND RECOMMENDATIONS	8
6.0 STATEMENT OF LIMITATIONS	16

APPENDIX

APPENDIX 'A'	Statement of Limitations
--------------------	--------------------------

ENCLOSURES

	<u>No:</u>
BOREHOLE LOCATION PLAN	1
BOREHOLE LOGS	2 , 3 and 4
TOPOGRAPHIC SURVEY	5
SLOPE STABILITY ANALYSIS	6 and 7

1.0 **INTRODUCTION**

V.A. Wood Associates Limited was retained by University of Ontario Institute of Technology (UOIT) to carry out a geotechnical investigation for the proposed addition to the ACE Building located at No. 2000 Simcoe Street North in Oshawa, Ontario.

The addition is to be built on the west side of the existing building and will have 2 storeys and a basement.

The purpose of the investigation was to reveal the subsurface conditions and to determine the relevant soil properties for the design and construction of the building foundations and the associated site services.

2.0 **FIELD WORK**

The field work was carried out on April 19, 2018 and consisted of three boreholes at the locations shown on Enclosure 1. The boreholes were advanced to the sampling depths by means of a power-auger machine, equipped for soil sampling. Standard Penetration tests were carried out at frequent intervals of depth and the results are shown on the Borehole Logs as N-values.

The field work was supervised by a field technician and the samples were transported to our soils laboratory for further examination and classification. The ground elevation at each borehole location was interpolated from the spot and contour elevations on the Site Plan.

3.0 **SUBSURFACE CONDITIONS**

Full details of the soils encountered in each borehole are given on the Borehole Logs, Enclosures 2, 3 and 4, and the following notes are intended to summarize this data.

*All of the boreholes encountered a surficial layer of **granular fill** 750± mm thick.*

*The granular fill was underlain by **fill** which extended to a depth of between 1 and 2.9 m below grade. This fill consisted generally of silty sand with some seams of silt. Standard Penetration tests in the fill gave N-values between 7 and 25 blows/300mm.*

Based on the test results, the fill is considered to be in a loose to compact condition.

*The fill in Boreholes 2 and 3 was underlain by a native deposit of **sandy silt** which extended to a depth of between 2.9 and 4 m below grade. This deposit is comprised of bedded silt with seams of fine sand. Standard Penetration tests in this deposit gave N-values between 22 and 40 blows/300mm.*

Based on the test results, the sandy silt is considered to have a compact to dense relative density.

The fill in Borehole 1 and the sandy silt in Boreholes 2 and 3 were underlain by a native deposit of silt till/clayey silt till which extended to a depth of between 4.8 and 5.5 m below grade. This glacial deposit is comprised of a silt or clayey silt matrix which contained traces of fine gravel. Standard Penetration tests in this deposit gave N-values between 22 and 42 blows/300mm.

Based on the test results, together with a visual and tactile examination, the silt till/clayey silt till is considered to have a very stiff to hard consistency.

The silt till in Borehole 1 and the clayey silt till in Borehole 2 were underlain by a deposit of clayey silt which extended to a depth of $7\pm$ m below grade. This deposit is comprised of bedded silt with seams of clay. Standard Penetration tests in this deposit gave N-values between 21 and 40 blows/300mm.

Based on the test results, together with a visual and tactile examination, the clayey silt is considered to have a very stiff to hard consistency.

The silt till in Borehole 3 was underlain by a deposit of silty sand which extended to a depth of $7\pm$ m below grade. This deposit is comprised of fine sand with seams of silt. A Standard Penetration test in this deposit gave an N-value of 87 blows/300mm.

Based on the test result, the silty sand is considered to have a very dense relative density.

The clayey silt in Boreholes 1 and 2 and the silty sand in Borehole 3 were underlain by a deposit of silty clay which extended to a depth of $8.5 \pm m$ below grade. Standard Penetration tests in this deposit gave N-values between 14 and 28 blows/300mm.

Based on the test results, together with a visual and tactile examination, the silty clay is considered to have a stiff to very stiff consistency.

The silty clay in Borehole 3 was underlain by a deposit of sandy silt till, which extended to a depth of $10 \pm m$ below grade. This glacial deposit is comprised of a sandy silt matrix which contained traces of clay and fine gravel. A Standard Penetration test in the deposit gave an N-value of 18 blows/300mm.

Based on the test results, the sandy silt till is considered to have a compact relative density.

The silty clay in Boreholes 1 and 2, and the sandy silt till in Borehole 3 were underlain by a deposit of gravelly sand, which extended to a depth of $11.5 \pm m$ below grade. This deposit is comprised of well graded sand with some gravel. Standard Penetration test in the deposit gave N-values between 10 and more than 100 blows/300mm.

Based on the test results, the gravelly sand is considered to have a compact to very dense relative density. The low N-value in Borehole 2 was likely due to boiling of the sand.

The gravelly sand was underlain by a lower deposit of sandy silt till which extended to the maximum depth investigated (i.e., more than 12.5 m below grade). This till consisted of a sandy silt matrix which contained traces to some fine to medium gravel. Standard Penetration tests in this deposit gave N-values of more than 100 blows/300 mm.

Based on the test results, the sandy silt till is considered to have a very dense relative density.

4.0 **GROUNDWATER CONDITIONS**

A free water surface was encountered in the boreholes at a depth of 2.7 m below grade, just above the cave in level of between 3 and 3.4 m. It is noted that the ground water was measured immediately after drilling, and it is likely that the groundwater has not stabilized in the boreholes.

An examination of the soil samples revealed that they were generally moist and a change in colour of the native soil samples from brown to grey was observed at a depth of between 3 and 4 m below grade.

Based on the findings, the permanent groundwater table is considered to be located at a depth of at least 3 m below grade. However, perched water conditions may occur within the fill and on top of low permeability native sandy silt and silt till deposits.

5.0 DISCUSSION AND RECOMMENDATIONS

5.1 General

The boreholes encountered 750± mm thick granular fill, underlain by 0.4 to 2.2 m of loose to compact fill, then generally competent native deposits of glacial till, clayey silt, silty sand, silty clay and gravelly sand. The permanent groundwater table is considered to be located at a depth of at least 3 m below grade, although perched water conditions may occur within the fill and on top of the sandy silt and silt till deposits.

It is understood that the structure will have two storeys and a basement with a floor level at about the same level as the existing grade. It is anticipated that the structure will be supported by reinforced concrete foundation walls on shallow strip and pad footings. Full details of the proposed structure were not yet available at the time of this report and the following recommendations should, therefore, be reviewed when these details are available.

5.2 Foundations

It is understood that the proposed elevation of the foundations are to be at Elev. 146. Based on the Boreholes Logs the foundation subgrade will likely be comprised of dense sandy silt or very stiff to hard silt till or clayey silt till. These strata are considered capable of supporting normal footings designed to an SLS bearing pressure of at least 200 kPa (300 kPa ULS).

It is estimated that the total and differential settlements of footings designed to the above bearing pressure will be less than 25 and 20 mm, respectively. These are normally considered to be acceptable for the proposed structure.

All exterior footings or footings in unheated areas should be located at least 1.2 m below finished grade for adequate frost protection. Footings adjacent the existing building should not be located at a higher elevation, and should preferably at the same level as the existing.

The minimum footing sizes should not be less than those specified in the National Building Code of Canada. Elevation differences between adjacent footings should not be more than a half of the horizontal distance between them.

All foundation excavations should be inspected by geotechnical personnel from V.A. Wood Associates Limited to ensure the founding soils are similar to those identified in the Borehole Logs and that they are capable of supporting the design loads.

It is understood that the footings adjacent to the existing building may be founded on helical piers and, in this case, the design would be done by a specialist contractor.

Based on the Ontario Building Code of 2012, the classification of soils for seismic site response should be based on the average soil properties of the top 30 m of the soil profile. The boreholes were only 12.5 m deep and were terminated in very dense sandy silt till. The

very dense soils are expected to extend to depth and, in this case, a Site Class 'C' classification may be used for this site.

For the design members resisting lateral loads the recommended soil parameters are as follows:

Soil Parameters	Loose Fill	Compact to Dense Sandy Silt Till	Very Stiff Silt Till and Clayey Silt Till
Unit Weight	19 kN/m ³	21 kN/m ³	20 kN/m ³
Friction Angle	28°	33°	30°
Cohesion	0	0	0
Coefficient of Earth Pressure At Rest	0.53	0.46	0.5
Coefficient of Active Earth Pressure	0.36	0.29	0.33
Coefficient of Passive Earth Pressure	2.8	3.4	3.0
Coefficient of Friction	--	0.45	0.4

5.3 Basement

The basement walls and other earth retaining structures should be designed to resist lateral earth pressures, the magnitude of which can be determined from:

$$p = K (\gamma d + q)$$

where

$$p = \text{earth pressure, kN/m}^2$$

$$K = \text{earth pressure coefficient, 0.5 for sand fill}$$

$$\gamma = \text{unit weight of backfill, 20 kN/m}^3 \text{ for sand}$$

$$d = \text{depth below finished grade, metres}$$

$$q = \text{surcharge on backfill, kN/m}^2$$

Water will tend to collect around and under the basement, which should, therefore, be designed against hydrostatic water pressure, unless a perimeter and sub-floor drainage system is installed. Water collected in this system should be connected to the local storm drainage system either by gravity or by permanent sump pump(s).

5.4 Floor Slab

The subgrade for the floor slab is likely to consist of compact sandy silt or very stiff silt till or clayey silt till. Any loose fill encountered (possibly on the north side) should be sub-excavated and replaced with approved compacted fill.

The exposed subgrade should be inspected and soft or wet areas identified should be removed and replaced with approved fill. Any fill required should be comprised of approved on-site or imported material placed in not more than 200 mm thick horizontal loose lifts and compacted to at least 98% of its Standard Proctor maximum dry density (SPMDD).

A layer of well-graded free-draining granular material, at least 150 mm thick and compacted to 98% SPMDD should be placed under the floor slab to provide a uniform bearing surface and to act as a vapour barrier.

It is noted that a finished floor of the basement will be lower than the water level of the stormwater retention pond during both a 100 year storm and emergency overflow, which are

understood to be at Elev. 147.9 m and 148.3 m, respectively. In this case the basement floor and walls should be designed to resist groundwater uplift pressures.

5.5 Service Trenches

It is anticipated that the service trenches will generally be less than 3± m below finished grade. Reference to the Borehole Logs indicates that the subgrade will likely be composed of compact sandy silt or very stiff silt till or clayey silt till, which will generally provide adequate support for the pipes and allow the use of normal Class 'B' bedding using Granular 'A' material.

Clear crushed stone should not be used as bedding otherwise the fines from the surrounding silty subsoil may migrate into the voids of the stone and cause undesirable settlements.

If there is local softening of the trench grade, then the bedding thickness may have to be increased.

The backfill around manholes should consist of well compacted granular materials.

5.6 Excavation and Groundwater Control

No major construction problems due to water, are anticipated with excavations to a depth of less than 3 m below grade. Provision should, however, be made for control of any surface

water run-off and any subsurface seepage by pumping from local sumps as and where required.

Excavations to a depth of more than 1.2 m should be cut back to a side slope of 1 to 1. Alternatively, the excavation may be supported using adequately braced sheeting.

To minimize potential problems, backfilling operations should follow closely after excavation so that only a minimal length of trench slope is exposed. Should construction be carried out in the winter season, particular attention should be given to make sure frozen material is not used as backfill.

5.7 Slope Stability Analysis

The proposed addition is to be built on the tableland above a 5 to 7 m high slope, and a slope stability analysis was carried out to assess the impact of the development on the slope stability.

The analysis was carried out along Section A, shown in Enclosure 5. Based on the borehole findings the developed cross section is shown in Enclosure 6. The ground water table is assumed to be located at least 3 m below grade at the building area and dips down the slope. The water level at the bottom of the slope is based on flood conditions for the west ravine.

No laboratory soil strength tests were carried out, and the soil parameters used were based previous experience on similar materials. These soil parameters are shown on the upper left corner of the slope section, and are consistent with and are on the conservative side of the parameters given in Tables 2.4 to 2.6 of the Geotechnical Principles of Stable Slopes (MNR, November 2007). The building surcharge was assumed to be a uniformly distributed load (rather than as a strip load), which is also a conservative assumption.

The analysis was carried out using the commercial slope program G-Slope. This is a limit equilibrium slope stability analysis program which calculates the Factor of Safety (FOS) against circular failure of different slope configurations using the assessed soil and ground water parameters. The FOS is the factor by which the soil strength must be reduced in order to bring the slope into a state of limit equilibrium (or imminent failure) along a given slip surface. Bishop's Modified Method was used in the analysis. CLOCA requires a minimum FOS of 1.5 for stable slopes. The results of the analyses are shown in Enclosures 6 and 7.

Enclosure 6 shows that the slip circle that would affect the proposed addition has an FOS of at least 1.9.

Enclosure 7 shows a slip circle with an FOS close to 1.5. This slip circle indicates that the Stable Top of Slope is almost coincident with the existing top of slope.

The proposed addition is to be located about 11 m from the stable top of slope, and will not have an adverse impact on the slope stability.

5.8 Erosion Control

The vegetation on slope should be maintained. The vegetation aids in increasing slope stability against shallow failures by increasing the effective cohesion within the surficial soils. During construction of the septic system, all equipment and materials and any soil stockpiles should always be located away from the slope. Any disturbed surfaces should be protected from erosion by sodding/vegetation or with paving stone as soon as possible after completion of construction.

6.0 STATEMENT OF LIMITATIONS

The Statement of Limitations presented on Appendix 'A' is an integral part of this report.

V.A. WOOD ASSOCIATES LIMITED

Prepared by:

Rene Quiambao, P. Eng.



Reviewed by:

V. Wood, M.Eng., P.Eng.,

RQ/VW



APPENDIX

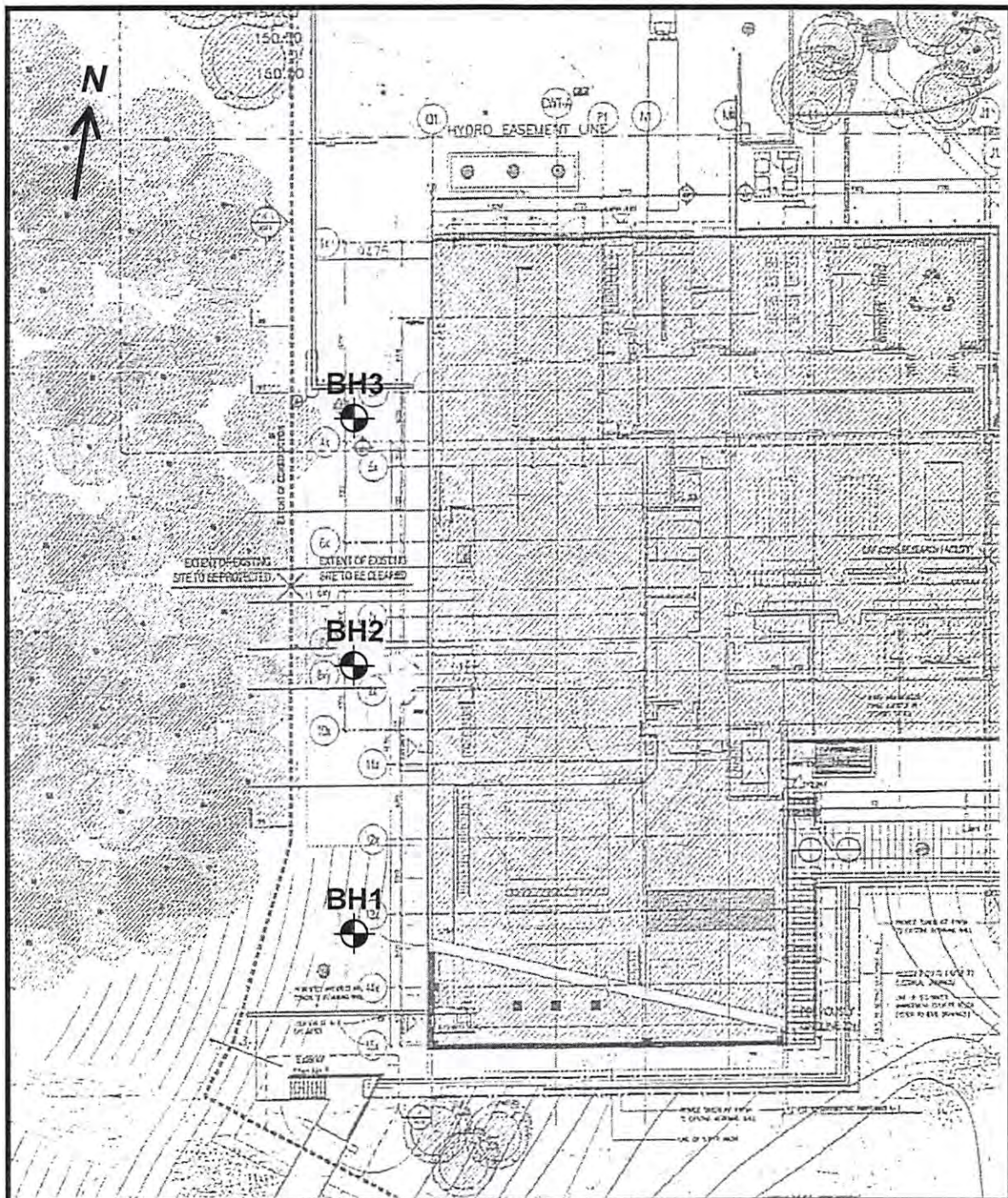
STATEMENT OF LIMITATIONS

The conclusions and recommendations in this report are based on information determined at the borehole locations and on geological data of a general nature which may be available for the area investigated. Soil and groundwater conditions between and beyond the boreholes may differ from those encountered at the borehole locations and conditions may become apparent during construction which would not be detected or anticipated at the time of the soil investigation.

We recommend that we be retained to ensure that all necessary stripping, subgrade preparation and compaction requirements are met, and to confirm that the soil conditions do not deviate materially from those encountered in the boreholes. In cases where this recommendation is not followed the company's responsibility is limited to interpreting accurately the information encountered at the boreholes.

This report is applicable only to the project described in the introduction, constructed substantially in accordance with details of alignment and elevations quoted in the text.

ENCLOSURES



BOREHOLE LOCATION PLAN

Reference No : 3890-ACE-18-3

Borehole No : 1

Enclosure No : 2

Client : Univ of Ontario Institute of Technology

Project : ACE Building Addition





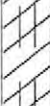


Method : Auger

Location : 2000 Simcoe St. N, Oshawa, ON

Diameter : 110mm

Datum Elevation : Geodetic

Date : April 19, 2018

SUBSURFACE PROFILE					SAMPLE										Remarks	
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value	Standard Penetration Test blows/300mm				Moisture Content, %				
								20	40	60	80	10	30	50		
148.6	0	Ground Surface													cave in at 3.4 m	
148.04		Granular Fill 750 mm			1	SS	11	○								
	1	<i>FILL</i> Silty sand, some seams of silt, trace topsoil, moist to wet, compact, loose at the bottom			2	SS	24	○								
					3	SS	25	○								
	2				4	SS	7	○								
145.7	3				5	SS	33	○								
	4	<i>SILT TILL</i> Hard, trace fine gravel, grey, moist			6	SS	42	○								
143.1	5															
	6				7	SS	40	○								
141.6	7	<i>CLAYEY SILT</i> Very stiff to hard, bedded silt with seams of clay, grey, moist			8	SS	14	○								
	8															
140.1		<i>SILTY CLAY</i> Stiff, grey, moist			9	SS	27	○								
	9															
	10				10	SS	62	○								
137.1		<i>GRAVELLY SAND</i> Compact to very dense, well graded sand, some gravel, trace silt, grey, wet														
	11															
	12	<i>SANDY SILT TILL</i> Very dense, trace to some fine to medium gravel, grey, moist			11	SS	100+	○								
136.1																
	13	End of Borehole														

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : 3890-ACE-18-3

Borehole No : 2

Enclosure No : 3

Client : Univ of Ontario Institute of Technology

Project : ACE Building Addition

Method : Auger

Location : 2000 Simcoe St. N, Oshawa, ON

Diameter : 110mm

Datum Elevation : Geodetic

Date : April 19, 2018

SUBSURFACE PROFILE					SAMPLE			Standard Penetration Test blows/300mm				Moisture Content, %			Remarks
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value								
148.9	0	Ground Surface													
148.34		Granular Fill 750 mm			1	SS	21	○							
147.9		<i>FILL</i>			2	SS	22	○							
	1	Silty sand, compact													
		<i>SANDY SILT</i>			3	SS	28	○							
	2	Compact, bedded silt with seams of fine sand, brown, wet			4	SS	40	○							
146															
	3				5	SS	22	○							cave in at 3 m
		<i>CLAYEY SILT TILL</i>													
	4	Very stiff, trace fine gravel, grey, moist													
144.1					6	SS	21	○							
	5														
		<i>CLAYEY SILT</i>													
	6	Very stiff, bedded silt with seams of clay, grey, moist			7	SS	28	○							
141.9															
	7														
		<i>SILTY CLAY</i>			8	SS	16	○							
140.4		Very stiff, grey, moist													
	9														
		<i>GRAVELLY SAND</i>			9	SS	10	○							
	10	Compact to very dense, well graded sand, some gravel, trace silt, grey, wet													
					10	SS	100+	○							
137.4															
	12	<i>SANDY SILT TILL</i>													
		Very dense, trace to some fine to medium gravel, grey, moist			11	SS	100+	○							
136.4															
	13	End of Borehole													

V.A. WOOD ASSOCIATES LIMITED

Disk :

Sheet : 1 of 1

Reference No : 3890-ACE-18-3

Borehole No : 3

Enclosure No : 4

Client : Univ of Ontario Institute of Technology

Project : ACE Building Addition

Method : Auger

Location : 2000 Simcoe St. N, Oshawa, ON

Diameter : 110mm

Datum Elevation : Geodetic

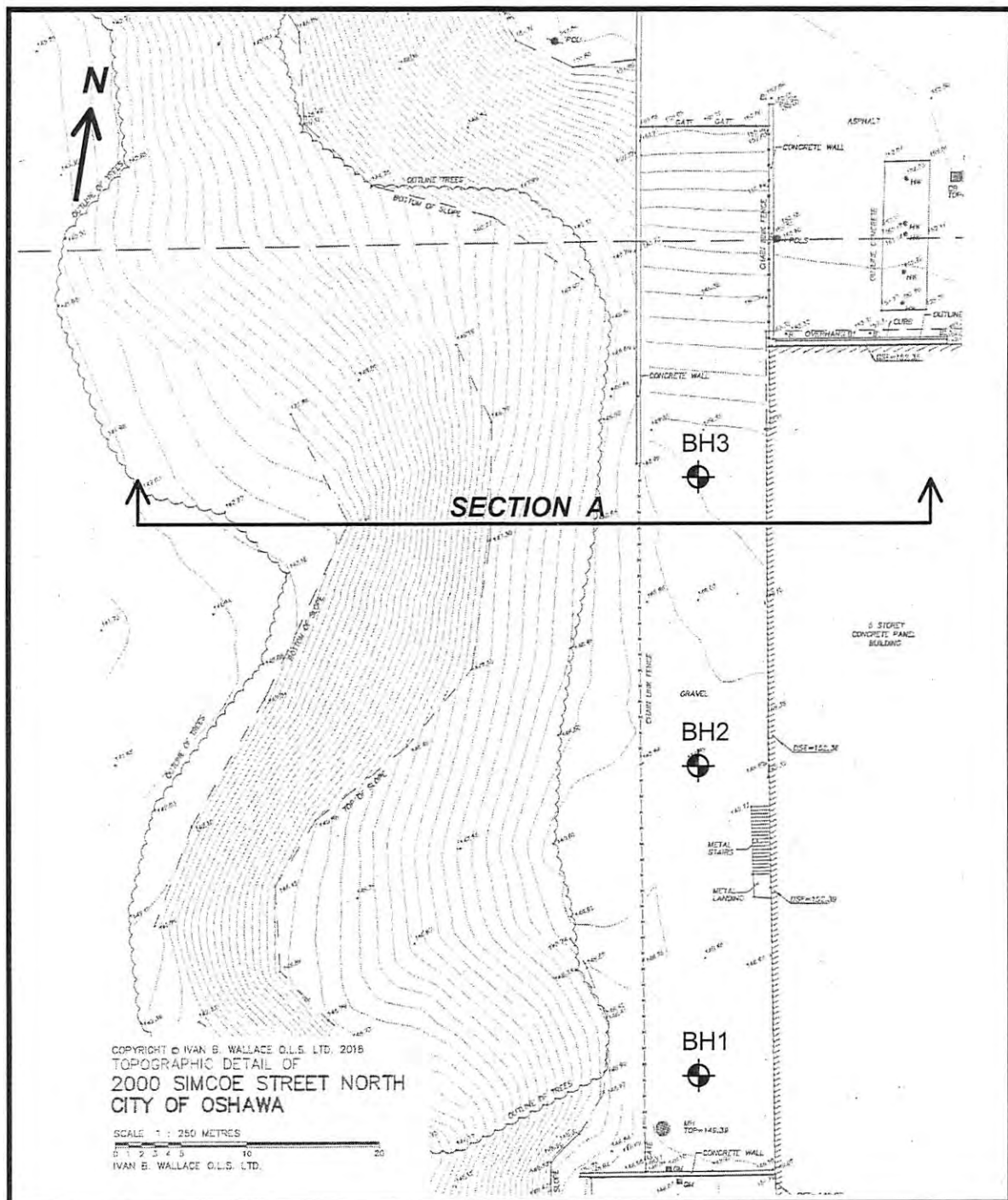
Date : April 19, 2018

SUBSURFACE PROFILE					SAMPLE			Standard Penetration Test blows/300mm 20 40 60 80				Moisture Content, % 10 30 50			Remarks
Elevation m	Depth m	Description	Symbol	Water	Number	Type	N-value								
149.2	0	Ground Surface													cave in at 3.4 m
148.64		Granular Fill 750 mm			1	SS	15								
148.2		FILL			2	SS	12								
	1	Silty sand, compact			3	SS	22								
	2	SANDY SILT			4	SS	35								
	3	Compact to dense, bedded silt with seams of very fine sand, brown, wet			5	SS	40								
145.2	4														
	5	SILT TILL			6	SS	35								
143.7		Very stiff to hard, trace fine gravel, grey, moist													
	6	SILTY SAND			7	SS	87								
142.2	7	Very dense, fine sand with seams of silt, grey, wet													
	8	SILTY CLAY			8	SS	28								
140.7		Very stiff, grey, moist													
	9	SANDY SILT TILL			9	SS	18								
139.2	10	Compact, trace fine gravel, trace clay, grey, wet													
	11	GRAVELLY SAND			10	SS	100+								
137.7		Very dense, well graded sand, some gravel, trace silt, grey, wet													
	12	SANDY SILT TILL			11	SS	100+								
136.7		Very dense, trace fine to medium gravel, grey, moist													
	13	End of Borehole													

V.A. WOOD ASSOCIATES LIMITED

Disk :

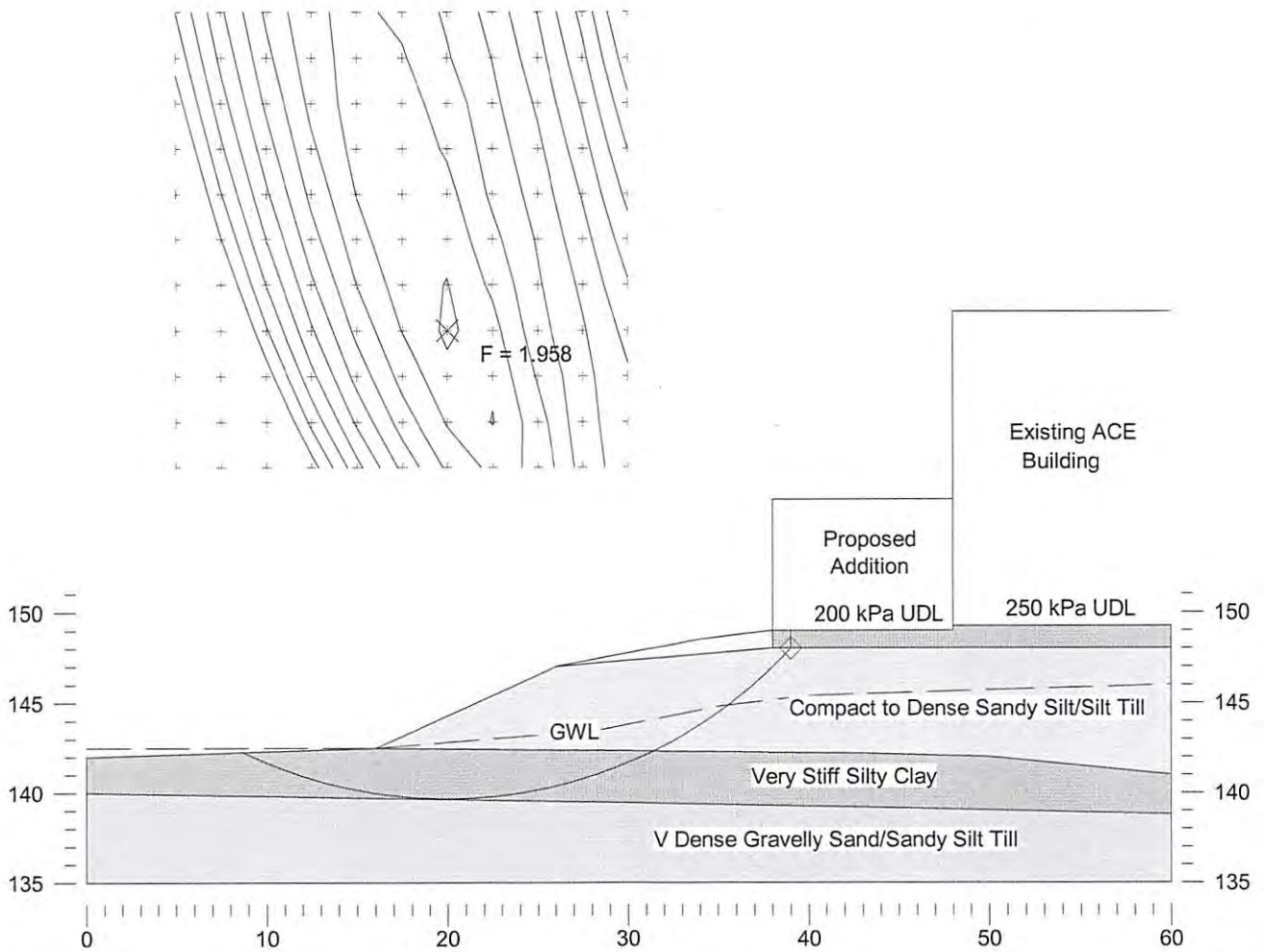
Sheet : 1 of 1



TOPOGRAPHIC SURVEY

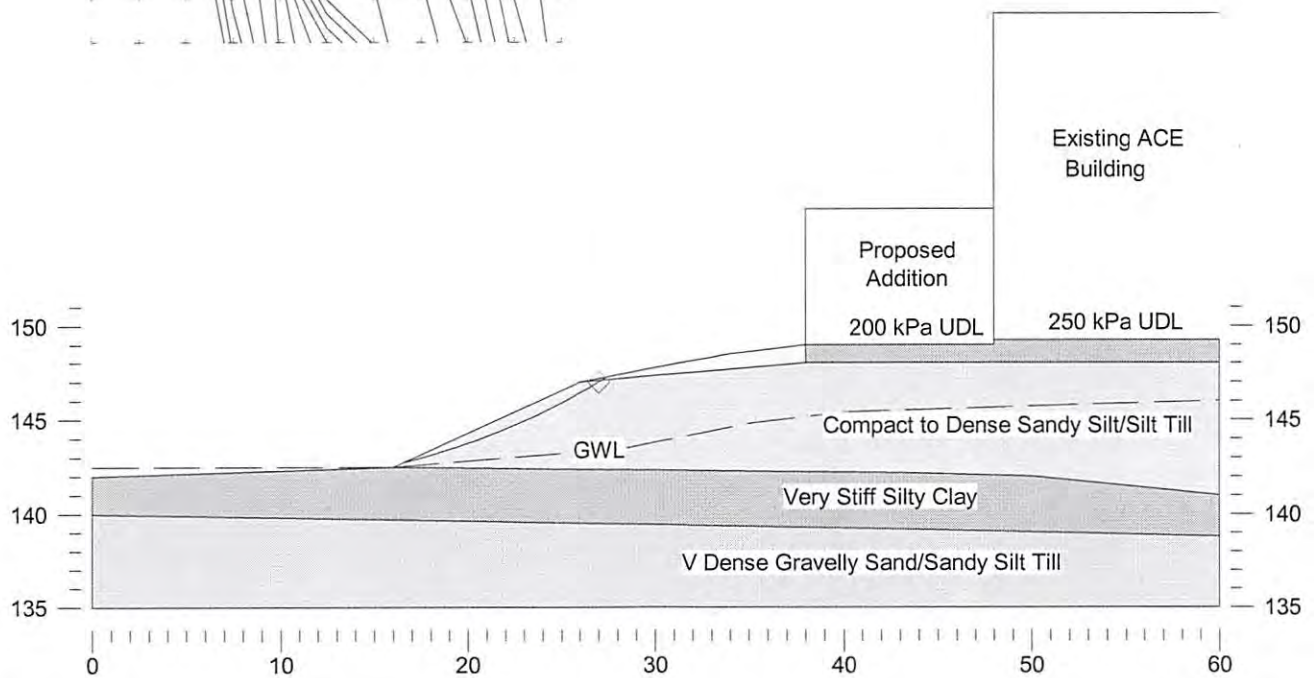
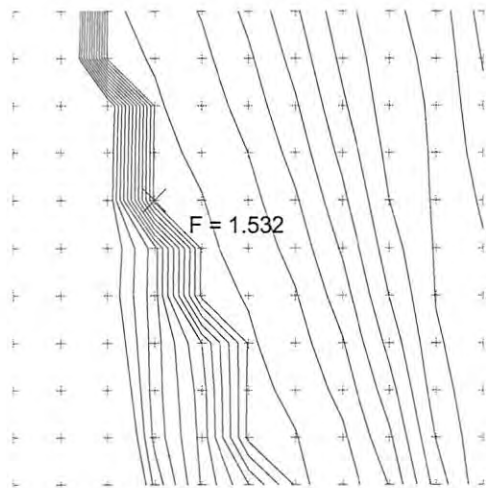
	Gamma kN/m ³	C kPa	Phi deg	Piezo Surf.
Bldg Surcharge	200	0	0	1
Fill	19	0	28	1
S Silt/Silt Till	21	0	33	1
Silty Clay	20	5	30	1
Grav Sand/SSTill	22	0	36	1

V.A. Wood Associates - Scarborough, ON
 3890-ACE-18-3
 ACE Building Addition
 April 2018
 Slope Stability Analysis
 SECTION A



	Gamma kN/m ³	C kPa	Phi deg	Piezo Surf.
Bldg Surcharge	200	0	0	1
Fill	19	0	28	1
S Silt/Silt Till	21	0	33	1
Silty Clay	20	5	30	1
Grav Sand/SSTill	22	0	36	1

V.A. Wood Associates - Scarborough, ON
 3890-ACE-18-3
 ACE Building Addition
 April 2018
 Slope Stability Analysis
 SECTION A



TIMBRO

REFRIGERATED STRUCTURES INC.

401 Enterprise Dr., Welland, Ontario L3B 6H8
Telephone (905)734-4513 Fax (905)734-4220

Mr. Vijyat Bhalla
UOIT Oshawa
2000 Simcoe St N
Oshawa, On L1H 7K4

May 24, 2018

RE: ACE Wind Tunnel Addition – Jamison Door

We are pleased to offer the following proposal per your request, for the Supply Only of the following:

Qty

1

Power Operated Bi-Parting Horizontal Sliding Steel Insulated Door, 37'2" width-in-clear x 15' 1" height-in-clear, 4" thick, complete with gaskets (single layer at sides and head), 8" steel channel header. Door supplied with standard hardware. Door and frame constructed of steel sheets and shapes with prime painted finish. Door skins consist of one (1) layer of 12 gauge sheets on the front and one (1) layer of 16 gauge sheets on the back. Sill seal is pneumatically activated and will require an air supply (by others). Door equipped with an electric safety edge on the leading edge of each door leaf. Door assembly will be supplied with two (2) Open-Close-Stop 3 button stations (one for the front side and one for the back side). All wiring of controls is to be by others. Power components provided for connection to 230 or 480V, 60 Hertz, 3 Phase current.
Separate 120 V AC power source required for latching device.

Clarifications/Exceptions:

1. Exclusive of all costs associated with installation, wiring, taxes, and finish painting.
2. No formal drawings or specifications supplied.
3. Each door leaf will be split once horizontally for shipping purposes and require job site assembly.
4. Subject to terms and conditions per Form 166T enclosed.
5. Relative Humidity is 5 to 95 possible, probably 25 to 75 worst case, and new area will have dehumidification
6. New area will never get below 0C
7. Rubber seals on door at floor are sufficient to hold back water
8. Door does not need to remain dry

The prices are F.O.B. factory, Hagerstown, Maryland with freight prepaid and included in our price to nearest point available for delivery by a common carrier.



website: www.timbrodesignbuild.com e-mail: info@timbrodesignbuild.com



TIMBRO

REFRIGERATED STRUCTURES INC.

401 Enterprise Dr., Welland, Ontario L3B 6H8
Telephone (905)734-4513 Fax (905)734-4220

Our quoted price does not include any tariffs, taxes, custom fees or any other related charges.
Timbro is responsible for supplying broker for shipping into Canada.
Payment terms are 50% Due upon Order Acceptance. Balance required prior to delivery.

Pricing is valid if ordered prior to August 21, 2018 and shipped before March 1, 2019.

Estimated lead-times: Drawing for approval within 1-2 weeks after receipt of order; Preparation of shop drawings and fabrication normally requires approximate 12-14 weeks after receipt of approved drawings and final information. Lead times are estimates only and may vary depending on production levels.

Best Regards,

Ron Ortiz

Timbro Group of Companies

401 Enterprise Dr.

Welland, On. L3B -6H8

Ph: 905-734-4513

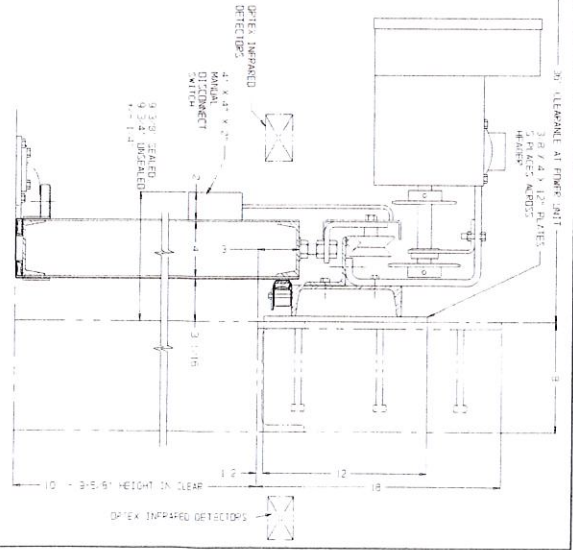
Cell: 905-714-6448

E-Mail: rortiz@timbrodesignbuild.com



website: www.timbrodesignbuild.com e-mail: info@timbrodesignbuild.com





IS AMP 3 POLE FUSED
DISCONNECT SWITCH
NOT BY JANISON
INSTALLED TO LOCATE
ADJACENT TO HOD
AT ADJACENTS PERMIT

NOTE. VERTICAL SECTION.

- [illegible]

100

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 08-09-2007 BY 60322 UCBAW

NAME	MR. [REDACTED]
DATE	11-11-01
TIME	10:00
LOCATION	1000 [REDACTED]
REMARKS	[REDACTED]
NO. 7 370-1B	

NO. G-3703-1B

JAMISON DOOR COMPANY**CONDITIONS OF SALE****FORM 166T(Rev051413)**

PO Box 70 Hagerstown, MD 21741-0070 (Shipping address: 55 J. V. Jamison Drive, Hagerstown, MD 21740)

Phone: 1-800-532-3667 or 301-733-3100; Fax: 240-329-5155; Internet: www.jamisondoor.com; E-mail: contact@jamisondoor.com

QUOTATIONS: Unless otherwise stipulated in the quotation, prices are firm for 30 days provided an order is received with a release on or before that date for immediate fabrication and shipment. Beyond that they are subject to review depending on conditions at the time the order is placed and shipping requirements. Any changes to these terms that require legal review will result in additional charges or revocation of quote.

FREIGHT TERMS: Doors (except BMP Doors) - Continental U.S.A. and Canada- Net selling prices are f.o.b. factory, Hagerstown, Maryland, with freight allowed and prepaid to nearest freight station to destination via the most economical freight transportation to meet freight terms of competitive manufacturers, unless otherwise stated by Jamison. Jamison BMP Doors f.o.b. factory, shipped prepaid and freight added to invoice.

EXPORT: (Includes Alaska and Hawaii)- See detailed quotation for complete terms.

HARDWARE REPAIR AND REPLACEMENT PARTS: Net selling prices is f.o.b. factory, Hagerstown, Maryland. Shipping charges will be prepaid and listed separately on invoice unless purchaser states, "freight collect" on purchase order.

INSTALLATION: Net selling prices do not include installation of products, field supervision, or post installation inspection by Jamison personnel unless specifically stated in Jamison's written quotation.

TAXES: No local, State or Federal use, sales, or excise taxes are included in our net selling prices.

ELECTRICAL CODES: Jamison power operated doors are designed to meet the requirements of the National Electrical Code of 1984 for "General Industrial Equipment". We cannot guarantee compliance with local interpretation of this code or with other local requirements (including State and Federal).

O.S.H.A.: Jamison cannot guarantee that any of its products comply with the requirements of the Occupational Safety and Health Act of 1970. Compliance with this act depends upon many variables over which we have no control or knowledge, including the design and use of the areas of the building into which our doors will be installed. We will assist the purchaser or user, as much as possible in determining door specifications, which will meet O.S.H.A. requirements at the intended door locations.

ORDERS: All orders are subject to acceptance by the home office. Fabrication will not begin until a purchase order, including correct price, signed by purchaser, is received and approved by Jamison.

CREDIT: All orders are subject to credit approval for open account shipment.

SCHEDULES: All shipment and delivery schedules are subject to change due to conditions beyond our control, such as fire, strikes, accidents, delays in transit, and the like. Products will be shipped immediately upon completion of manufacturing.

CHANGES: Changes made to an order before or after fabrication has begun must be confirmed in writing before fabrication can proceed. Purchaser agrees to pay cost of changes resulting in an increase in the total price of the order.

CANCELLATIONS: When an order is canceled before fabrication has begun, purchaser is liable for processing costs, such as approval or fabrication drawings, special purchased material, and the like. When an order is canceled after fabrication has begun, purchaser agrees to pay for labor and material costs incurred up to the time of cancellation. Purchaser must confirm said cancellations in writing.

AFTER SHIPMENT: Purchaser is responsible for cost of factory or field changes that are necessary to make products conform to local requirements. Products will be manufactured as scheduled and shipped immediately upon completion of fabrication. In the event products cannot be shipped as scheduled, Jamison will issue proforma invoice for products in accordance with PAYMENT TERMS below. Storage charges will accumulate after ten (10) days in accordance with fee schedule and invoiced once doors are shipped.

CLAIMS-DAMAGE: Be sure to note damaged or missing items on delivery receipt before accepting shipment. Hidden damage must be reported to the carrier immediately upon discovery (do not continue uncrating of product), but no later than 15 days after receipt of shipment. Official claims for damage reported must be made to the carrier as soon as practical, but no more than 9 months after delivery. Although title passes to purchaser upon delivery to carrier at our factory, we are willing to assist the purchaser in the processing of claims.

CLAIMS-OTHER: Claims for incorrect products, or products received in defective condition, must be settled before product is installed (see "Warranty").

RETURN OF MATERIAL: No products may be returned without home office approval.

EXPORT: See detailed quotation for complete terms.

PAST DUE ACCOUNTS: All past due accounts will be assessed interest at 1 1/2% per month (18% per annum). Accounts unpaid 90 days from date of invoice will be collected through legal process and collection will include attorney's fees and court costs in addition to interest.

WARRANTY: The Jamison Door Company warrants to the original owner of this product that the door and its component parts, excluding normal wear and tear, will be free of defective materials and improper workmanship for a period of five (5) years commencing with the date of shipment from the plant. Only defects called to Jamison's attention during this period of time will be covered under this warranty. This warranty is null and void if product is altered in any way without advanced written consent of Jamison Door Company. VERSAFLEX and PAD DOOR products are warranted as above except door leaves are warranted for period of one (1) year commencing with date of shipment from Jamison plant. RETAIL PRO products are warranted as above except for a period of one (1) year commencing with the date of shipment from Jamison plant. Sound and Special Purpose Doors are warranted as above except for a period of two (2) years commencing with date of shipment from Jamison plant. BMP Products are warranted as above except for a period of three (3) years commencing with date of shipment from Jamison plant.

Jamison will repair or replace, free of charge, freight prepaid (carrier of Jamison's choice), any door or its component parts, which are found defective upon inspection by an authorized Jamison representative. Jamison will not, however, be responsible for any installation costs incurred during replacement, or for replacement or repair of any materials subjected to excessive abuse, misuse, or improper installation.

This provision of replacement shall be the limit of Jamison's responsibility under this warranty, and Jamison shall not be responsible for any other losses or damages claimed to be caused by any door or parts covered under this warranty.

Products or component parts used on the doors but not manufactured by Jamison (such as motors, all electrical components, purchased hardware) are warranted by Jamison to the purchaser to the same extent that the original manufacturer to Jamison warrants them.

No other oral or written representation made by Jamison or its agents are a part of this warranty unless specifically set forth in writing by an authorized Jamison official.

THE ABOVE SET FORTH WARRANTY IS SELLER'S SOLE WARRANTY. SELLER MAKES NO OTHER WARRANTY OF ANY KIND WHATEVER, EXPRESS OR IMPLIED; AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE AFORESTATED OBLIGATION ARE HEREBY DISCLAIMED BY SELLER AND EXCLUDED FROM THIS AGREEMENT.

DO NOT MODIFY OUR DOORS IN ANY MANNER WITHOUT ADVANCED WRITTEN CONSENT.