



**TENDER DOCUMENTS  
AND  
SPECIFICATIONS  
#250424**

**Kelso Arrival Centre Renovation  
2025**

**ISSUE DATE: April 24, 2025  
CLOSING DATE: May 21, 2025  
on or before 2:00 p.m.**

**Mandatory Site Meeting Date: May 1<sup>st</sup>, 2025  
10:00 a.m., 5234 Kelso Rd, Milton ON**

## Section No. 1

# TENDER NOTICE

## CONSERVATION HALTON REQUEST FOR TENDERS NOTICE

Conservation Halton is interested in contracting for the following works: Improve access to our pedestrian bridge over CP rail lines at Kelso Conservation Area, Milton. Tenders are invited for all works related to drawings and specifications provided by Red Studio Architects. Conservation Halton intends to issue contract to one entity/general contractor.

**ELECTRONIC TENDER SUBMISSIONS ONLY**, shall be received by the Bidding System, no later than **2:00:00 p.m. (14:00:00 hours) local time, on May 21, 2025.**

Bidders are cautioned that the timing of their Bid Submission is based on when the Bid is **RECEIVED** by the Bidding System, **not** when a Bid is submitted by a Bidder as Bid transmission can be delayed in an ***“Internet Traffic Jam”*** due to file transfer size, transmission speed, etc.

For the above reasons, the Conservation Halton recommends that Bidders allow sufficient time to upload their submission and attachment(s) (if applicable) and to resolve any issues that may arise. The closing time and date shall be determined by Conservation Halton’s Bidding System web clock.

The Bidding System will send a confirmation email to the Bidder advising that their bid was submitted successfully.

Late Bids shall not be accepted by Conservation Halton’s Bidding System.

To ensure receipt of the latest information and updates via email regarding this bid or If a Proponent has obtained this Proposal Document from a third party, the onus is on the Proponent to create a Bidding System Vendor account and register as a Plan Taker for the bid opportunity at the at <https://conservationhalton.bidsandtenders.ca>

### **Electronic Bid Submission;**

Conservation Halton (hereinafter called “the Owner”) shall **only** accept and receive Electronic Proposal submissions through the Owner’s Bidding System, hereafter called the **‘BIDDING SYSTEM’**.

HARD-COPY SUBMISSIONS SHALL **NOT** BE ACCEPTED.

If a Bidder needs to address any discrepancies, errors and/or omissions in the Bid Document, or if they are in doubt as to any part thereof they shall submit questions in writing through Bidding System using the “Submit Question” feature associated with the Bid Opportunity. Emailed questions are not permitted.

## Section No. 2

# **INFORMATION FOR BIDDERS**



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## **2.1 Personal Knowledge**

The Bidders shall have personal knowledge of the locations of the proposed Works and shall inform themselves as to the actual conditions and requirements thereof, and shall not claim at any time after the submission of the tender that there was any misunderstanding in regard to the conditions imposed by the Contract.

## **2.2 Omissions, Discrepancies and Interpretations**

Should a Bidder find omissions from or discrepancies in any of the tender documents or should they be in doubt as to the meaning of any part of such documents, they should immediately submit their question or concern through the Bidding System. If the Halton Region Conservation Authority (hereby shall be known as “Conservation Halton” or “Owner”) considers that a correction, explanation or interpretation is necessary or desirable, an addendum will be issued. No oral explanation or interpretation shall modify any of the requirements or provisions of the tender documents.

## **2.3 Bidder's Ability and Experience**

It is not the intention of the Conservation Halton to award a Contract to any Bidder who does not furnish satisfactory evidence that they have the ability and experience to perform the various types of work involved, and that they have sufficient capital to enable the Bidder to prosecute the same successfully and to complete them in the time named in the Contract. The onus is on the bidder, through submission of references and information requested within this bid, to prove they have the means and experience to complete this project.

## **2.4 Unbalanced or Undervalued Tenders**

Tenders that contain pricing that appear to be greatly undervalued or where there is doubt that work can be completed for the price bid, the owner will contact the bidder to discuss concerns. After discussion, if the Owner is not confident that pricing is adequate to cover the costs of the work specified, the Owner reserves the right to reject the bid.

## **2.5 Freedom of Information**

The information collected in response to this document is collected and subject to the provisions of the Freedom of Information and Privacy Act. The information collected will be used solely for the purpose stated herein.

## **2.6 Withdrawal or Revision of Tenders**

Bidders may edit or withdraw their Bid Submission prior to the closing time and date. However, the Bidder is solely responsible to:

- i) make any required adjustments to their Bid; and
- ii) acknowledge the addendum/addenda; and

- iii) Ensure the re-submitted Bid is **RECEIVED** by the Bidding System before the closing time, the system will not accept bids later than the time and dated noted in the Bidding System

## 2.7 Tender Form

The tender form included within the Bidding System must be fully completed or the system will not allow the bidder to submit their tender. The onus is on the bidder to ensure all system requirements are met and the Owner take no responsibility of the inability of the bidder to submit their bid on time.

## 2.8 Tender Prices

The lump sum prices or unit prices quoted in the Form of Tender shall, unless otherwise stated or specified, include the furnishing of all materials, supplies and equipment and providing of all expertise, labour, construction tools and equipment, utility and transportation services necessary to perform and complete all the work required under the Contract, including all miscellaneous work, whether specifically included in the Contract Documents or not. It is the intention of the Drawings and Specifications to provide finished work. Any items omitted there from which are clearly necessary for the completion of the work or its appurtenances shall be considered a portion of the work though not directly specified and/or shown or called for on the Drawings. The Owner relies on the expertise and knowledge or the bidder to anticipate all work and material (etc) required to complete the project.

In the event of an increase or decrease in the quantity of any particular item of work, the actual quantity executed will be paid for at the rate stated in the Form of Tender for that item, subject to the General Conditions for additions and deductions.

If requested by the Owner and after closing of the bids and where tenders contain unit prices and/or lump sums as the basis of payment, the Owner may request the Bidder to submit details of how each lump sum item in the tender is made up before the execution of a contract.

The Harmonized Sales Tax ("HST") will apply to this Contract.

HST – Where goods and services are supplied under this Contract by the Successful bidder, the lump sum prices and/or the unit bid prices **shall not** include the Harmonized Sales Tax ("HST"). HST will be shown separately and added, by the successful bidder, to all invoices. The Bidder will also be required to supply to the Conservation Halton his/her/its HST Registration Number.

Where a change in Canadian Federal or Provincial taxes occurs after the tender closing date for this Contract, and this change could not have been anticipated at the time of bidding, the Conservation Halton will increase or decrease contract payments to account for the exact amount of tax change involved.

Claims for compensation for additional tax cost shall be submitted by the Successful bidder to the Owner. Such claims for additional tax costs shall be submitted not later than 30 days after the date of acceptance of the Work.

Where the Successful bidder benefits from a change in Canadian Federal or Provincial taxes, the successful bidder shall submit to the Owner a statement of such benefits. This statement shall be submitted not later than 30 days after the date of acceptance of the Work.

The Owner reserves the right to make deductions from regular progress payments to compensate for the estimated benefit from decreased tax costs. Such deductions will be set-off from contract payments pending receipt of the statement itemizing the benefits, which have resulted from a decrease in tax costs, at which time the final payment adjustment will be determined.

## **2.9 Forfeiture of Deposit**

If, after a tender has been accepted, the successful Bidder fails to execute the Contract and to furnish the required bonds and sureties within 7 Working Days after written notice to the Bidder of such acceptance, the sum deposited by the Bidder shall be forfeited, without recourse to the use of the Owner.

## **2.10 Bonding Requirements**

Each submission must be accompanied by a digital Bid bond and a digital Agreement to Bond. Conservation Halton will only accept submissions that include both the Bid Bond and Agreement to Bond in an electronically verifiable/enforceable (e-Bond) format. A digital bid bond should be provided in the amount of 10% of the total tendered price. The successful Bidder shall be required to furnish, at its own expense, a performance bond in an amount equal to one hundred percent (**100 %**) of the tender sum, and a labour and material payment bond in an amount equal to fifty percent (**50 %**) of the tender sum.

<https://www.surety-canada.com/en/ebonding/index.html>

Information at this site includes;

- A list of third parties that provide online surety digital bond services such as Mobile Bonds or Xenex. The Owner does not endorse or promote any third party digital bond service provider.
- An Industry Checklist which Digital Bonds provided should meet.

All instruction details for accessing authentication should be included with the uploaded Bond.

**Note: A scanned pdf copy of bonds are not acceptable and will result in your bid being rejected.**

Bidders shall upload both their Bid Bond and Agreement to Bond (as instructed below) to the Owner's Bidding System, in the bid submission file labelled "Bid Bond and Agreement to Bond".

Bidders shall create a single zip file (see Bidding System instructions on how to create a zip file) containing both their Bid Bond and Agreement to Bond and upload the zipped file to the file labelled "Bid Deposit and Agreement to Bond".

## **2.11 Workplace Safety and Insurance Board Coverage**

Workplace Safety and Insurance coverage is applicable and required where successful bidders engage in any form of work on Conservation Halton premises. Successful bidders without Workplace Safety and Insurance coverage shall be required to submit a "Certificate of Clearance" to enable Conservation Halton to obtain a Workplace Safety and Insurance Board ruling to determine an "Independent Operator" status.

The successful bidder clearly understands and agrees that he/she/it is not, nor is anyone hired or subcontracted by him/her/it, covered by Conservation Halton under the Workers' Compensation Act, and he/she/it shall be responsible for and shall pay all dues and assessments payable under the Workers' Compensation Act, the Unemployment Act, or any other Act, whether Provincial or Federal, in respect of his/her/itself, his/her/its employees and operations, and shall, upon request furnish Conservation Halton with such satisfactory evidence that he/she/it has complied with the provisions of any such acts. If the Successful bidder fails to do so, Conservation Halton shall have the right to withhold payment of such sum or sums of money due to the Contractor that would be sufficient to cover his/her/its default and Conservation Halton shall have the right to pay same.

Information on coverage under the Workers' Compensation Act can be obtained directly from the Workplace Safety and Insurance Board.

Conservation Halton is not and shall not be deemed to be the employer of the Contractor any subcontractor or their respective personnel under any circumstances whatsoever.

## **2.12 Assignment Subletting (Subcontractors)**

The Bidder shall provide, where indicated in Conservation Halton's Bidding System, the name and address of each proposed Subcontractor used in making up their tender and shall state the portion of the work allotted to each. Only one Subcontractor shall be named for each part of the Work to be subcontracted. The total value of

the work sublet shall not exceed 50% of the total tender.

After the tender has been accepted by Conservation Halton, the Contractor shall not be allowed to substitute other contractors in place of those named in their tender without written approval from the Owner.

### **2.13 Indemnification**

The Contractor covenants and agrees to indemnify and save Conservation Halton, its directors, officers, employees and agents harmless from any liability, action, claim, loss, injury, damage, payment, cost, fine, fine surcharge, recovery or expense, including assessable legal fees arising out of the performance of its obligations under this Agreement, including without limitation any negligent act or omission by any employee, agent or subcontractor or anyone else for whom it is in law responsible, save and except where the liability, action, claim, loss, injury, damage, payment, cost, fine, fine surcharge, recovery or expense, including assessable legal fees, arises out of the negligence of Conservation Halton, its directors, officers, employees or agents. The Contractor agrees that it shall, at Conservation Halton's election, either assume Conservation Halton's defence or co-operate with Conservation Halton in the defence of any such action, including providing Conservation Halton with prompt notice of any such action and the provision of all material documentation. This indemnity applies to Conservation Halton's directors, officers, employees and agents provided that they were directors, officers, employees or agents at the time that the action arose.

### **2.14 Insurance**

Upon award of the contract or as otherwise required in this tender, the bidder will be required to upload completed insurance forms provided by Conservation Halton into the Bidding System. As policies near expiry, updated forms will need to be uploaded by the contractor for the duration of the contract

The Contractor shall effect prior to the commencement of the services, and shall maintain and keep in force during the carrying out of the services, comprehensive general liability insurance, and shall provide a complete certificate as provided by Conservation Halton and "The Halton Region Conservation Authority" shall be named as additional insured for works provided under this contract. The Contractor shall save harmless Conservation Halton against claims for contractual liability, personal injury, bodily injury, death, property damage, or other third party or public liability claims arising from any accident or occurrence in respect of the services performed by the Contractor, in an amount not less than FIVE MILLION DOLLARS (\$5,000,000.00) in respect of any one accident or occurrence.

The Contractor shall effect prior to commencement of the services, and shall maintain and keep in force during the carrying out of the services, automobile liability insurance. The policy shall protect the Contractor against all liability arising out of the use of owned and non-owned automobiles. The limits of the liability under this insurance policy shall be in an amount not less than TWO MILLION DOLLARS (\$2,000,000.00) per occurrence.

The Contractor shall effect prior to commencement of the services, and shall maintain

and keep in force during the carrying out of the services, professional liability insurance. The policy shall protect the Conservation Halton against all liability arising out of errors and omissions of the consultant. The limits of the liability under this insurance policy shall be in an amount not less than TWO MILLION DOLLARS (\$2,000,000.00) per occurrence.

The Contractor shall effect, and shall keep in force during the carrying out of the services, any other form of insurance as Conservation Halton may from time to time require and the total Bid price shall be adjusted accordingly to allow for the costs of the additional premiums for such insurance.

In the event that Conservation Halton requests that the amount of coverage be increased under any policy of insurance required to be effected under this section, the Contractor shall endeavour forthwith to obtain such increased coverage and the total Bid price shall be adjusted accordingly to allow for the costs of the additional premiums for such insurance.

Any policies required to be effected by the Contractor shall, where available, contain a "cross-liability" clause.

The terms of the policies required to be effected by the Contractor under this section or any other provisions of this Agreement, and the insurers issuing them, are subject to the approval of Conservation Halton, but such approval shall not be unreasonably withheld. The terms of the policies as aforesaid shall also contain an undertaking by the insurers to notify Conservation Halton in writing not less than thirty (30) days prior to any material adverse change, cancellation or other termination thereof.

The Contractor shall pay all premiums and costs of all insurance required to be effected by the Contractor under any provision of this Agreement, and shall, prior to commencing the services, furnish to Conservation Halton a certificate of insurance, as provided by Conservation Halton, and from time to time keep on file with Conservation Halton renewal contracts and other documents sufficient to show and establish accurately at all times the current status of policies in force, and in particular shall submit to Conservation Halton not later than fifteen (15) days before the expiration of every current policy evidence of the renewal of the policy or the issuance of a replacement policy and of the payment of all premiums due for the renewal or replacement, and shall promptly notify Conservation Halton of any cancellation or intended cancellation by any insurer of any policy or any circumstances known to the Contractor materially affecting its coverage. The Contractor shall not cancel any policy of insurance without the prior written consent of Conservation Halton.

If the Contractor defaults on any of its obligations under this Agreement regarding insurance, Conservation Halton may, but is not obliged to, place any insurance at the cost and expense of the Contractor, or pay any arrears of premium, and any expense incurred by Conservation Halton shall be reimbursed to it by the Contractor on demand without prejudice to any other rights and remedies of Conservation Halton under this Agreement.

The Contractor shall be responsible for the payment of the deductible in the event of any claim and such deductible shall be subject to the approval of Conservation Halton.



## **2.15 Tender is Open to Acceptance and Irrevocable**

Providing also that this tender is to continue open to acceptance and irrevocable until the formal Contract shall be executed by the successful Bidder for the Work, and the bond, or bonds, hereinafter mentioned shall be executed by the approved surety or sureties, and that Conservation Halton may, at any time within **90 days** of closing date, accept this tender without notice, whether any other tender has previously been accepted or not.

## **2.16 Execution of Agreement and Bonds**

If this tender is accepted, the successful Bidder shall forthwith furnish as approved surety for the proper fulfillment of the Contract, at its own expense, a performance bond in an amount equal to one hundred percent (**100 %**) of the tender sum, and a labour and material payment bond in an amount equal to fifty percent (**50 %**) of the tender sum, and shall execute and upload the Agreement and Bonds, into the Bidding System, in a form satisfactory to Conservation Halton, within **7 Working Days** after being notified to do such by Conservation Halton.

## **2.17 Bidder's Offer**

By completion and delivery of the Tender, the Bidder acknowledges and confirms that the contractor or supplier shall supply and do all or any part of that which is set out or called for in this tender, on the terms and conditions and under the provisions set out or called for in these Contract Documents at the unit and lump sum prices hereunder stated.

## **2.18 Formal Contract**

This tender is subject to a CCDC-2 contract incorporating the terms and conditions contained within this document.

## **2.19 Commencement & Completion of Work**

The Work shall be started within 1-2 weeks of the contract award or as per an agreed schedule as submitted by the Contractor and approved by the Owner in order to obtain substantial completion by **November 1<sup>st</sup>, 2025**. Pedestrian access to the elevators is required each weekend (Saturday and Sunday) starting no later than **September 13<sup>th</sup>, 2025**. Should an extension of time be granted, submit letter and schedule in writing to the owner by the Owner the project shall be carried out to completion and possession given to Conservation Halton within the additional time as allowed.

## **2.20 General**

The clauses contained within this section, Information to Tenders are included in the Contract Documents and shall apply to the Work and the Contract and shall be binding upon the Contractor except and only to the extent that the same are expressly amended, deleted or replaced in these provisions or the Special Conditions.

All terms used herein and not otherwise defined shall have the meanings given to such terms as implied or according to custom.

These provisions shall be deemed to be included within and treated as part of the General Conditions forming part of the Contract Documents.

## **2.21 Currency and Taxes**

Prices submitted are to be:

- a) In Canadian dollars;
- b) Inclusive of duty, where applicable;
- c) FOB destination, delivery charges included where applicable; and
- d) Inclusive of Harmonized Sales Tax at 13%

## **2.22 Compliance with the Accessibility for Ontarians with Disabilities Act, 2005**

Conservation Halton is committed to the accessibility principles of preventing and removing barriers in accessing goods and services for people with disabilities and is bound by the Standards under the Accessibility for Ontarians with Disabilities Act, 2005 as may be amended from time to time. Regulations enacted under the Act apply to all designated public sector organizations and other third parties providing goods and services to members of the public on behalf of Conservation Halton. The consultant/contractor, its employees and all sub-contractors hired by the consultant/contractor in the completion of its work, must meet or exceed compliance with all applicable regulations under the Act that became effective January 1, 2010.

## **2.23 References**

Contractors must provide three satisfactory references prior to the award of a contract for services. References must be for projects of similar size and scope of the project being bid. The onus is on the contractor to provide proof they are capable and experienced to complete the work. Conservation Halton reserves the right to not award a contract to a bidder if satisfactory references cannot be obtained, or if the contractor can not provide proof of work of similar scope and value.

Reference forms are a mandatory requirement, the system will not allow the bid to be submitted unless the reference form is completed in the Bidding System

## **2.24 Questions/Inquiries and Addenda**

Bidders shall acknowledge receipt of any addenda when submitting their Bid through the Bidding System. Bidders shall check a box for each addendum/addenda and any applicable attachments that has been issued before a Bidder can submit their Bid submission online.

Addendum/Addenda will typically be issued through the Bidding System, Forty-eight (48) Hours prior to Closing Time and Date.

In the event an addendum is issued within Forty-eight (48) Hours prior to Closing Time and Date, it may include an extension of the Closing Time and Date. It is the responsibility of the Bidder to have received all Addendum/Addenda that have been issued. Bidders should check online at <https://conservationhalton.bidsandtenders.ca> prior to submitting their Bid and up until Bid closing time and date in the event additional addendums are issued.

The Owner encourages Bidders **not** to submit their Bid **prior to** forty-eight (48) hours before the Bid closing time and date, in the event that an addendum is issued. If a Bidder submits their bid prior to this or at any time prior to the bid closing and an addendum/addenda is issued by the Owner, the Bidding System shall **WITHDRAW** their Bid submission and change their Bid submission to an **INCOMPLETE STATUS (NOT accepted by the Owner)** and the Withdrawn Bid can be viewed by the Bidder in the **“MY BIDS”** section of the Bidding System. The Bidder is solely responsible to:

- i) make any required adjustments to their Bid; and
- ii) acknowledge the addendum/addenda; and
- iii) Ensure the re-submitted Bid is **RECEIVED** by the Bidding System no later than 2:00:00 p.m. (14:00:00 hours) local time, on the Bid Closing Date.

**NOTE:** Additional company contacts are recommended for the reasons outlined below:

- Do **not** invite any additional contacts that you do not want to have access to view, edit, submit and/or withdraw or who may be in direct competition for example (a company may have two divisions that could compete for the same Bid Opportunity).
- You are strongly urged when creating or updating a Bidding System Vendor account to add additional company contacts to create their own login to the Bidding System. This will permit your invited contacts that have created their own login to manage (register, submit, edit and withdraw) Bids which your Company is a Registered Plan Taker for. In the event you are on vacation, or due to illness, etc. these additional contacts may act on your Company's behalf and have the authority to; receive addendum notifications from the Bidding System, and where permitted by the terms and conditions of the Bid Call Document, to submit Bids electronically through the Bidding System and/or withdraw and/or edit and/or acknowledge addendum/addenda, on your behalf.
- If you are an invited company contact it is imperative that you create your login from the link contained in the email invitation. Do NOT go directly to <https://conservationhalton.bidsandtenders.ca> website and create a separate vendor account.

**2.25 Special Provisions**

Any Special Provisions attached to this Agreement are an integral part hereof.

**2.26 Accessibility**

Conservation Halton is committed to the accessibility principles of preventing and removing barriers in accessing goods and services for people with disabilities and is bound by the Standards under the Accessibility for Ontarians with Disabilities Act, 2005 as may be amended from time to time. Regulations enacted under the Act apply to third parties providing goods and services to members of the public on behalf of Conservation Halton. The consultant/contractor, its employees and all sub-contractors hired by the consultant/contractor in the completion of its work, must meet or exceed compliance with all applicable regulations under the Act.

**2.27 Sustainability**

One of the principles of Conservation Halton's Purchasing Policy is to procure services with regard to the preservation of the natural environment, by encouraging suppliers to provide services that result in the least damage to the environment and incorporating recycled materials. Bidders are expected to carry out their work in an environmentally responsible manner.

**2.28 Protection of Property**

The Contractor shall continuously protect Conservation Halton's property and the adjacent property from damage, injury or loss arising in connection with this Agreement. It shall make good at its own expense any damage, injury or loss to Conservation Halton's property or adjacent property. Provided that it has taken reasonable precautions, the Contractor shall not be responsible for any such damage, injury or loss which Conservation Halton has agreed to insure or which maybe directly caused by Conservation Halton, its agents or employees.

**2.29 Health and Safety**

Conservation Halton is committed to promoting health and safety in the workplace by preventing accidents, injuries and occupational illness.

Where the services which are the subject of the successful Bid are performed on Conservation Halton's property or on behalf of Conservation Halton and outside of Conservation Halton's property, the Contractor is deemed to be the Constructor under law and shall at all times comply with the Occupational Health and Safety Act ( the Act), Regulations, Standards and Guidelines and shall be responsible for and take every precaution reasonable in the circumstances for the protection of all workers associated with the services being performed, whether employed by the Contractor, Conservation Halton or a third party and for the protection of third parties.

The Contractor acknowledges that it has read and understood the Act, Regulations, Standards and Guidelines and that it has provided training in relation to the Act, Regulations, Standards and Guidelines to its supervisors and employees.

Notwithstanding the foregoing, the Contractor shall comply with all other applicable laws, by-laws, ordinances, orders, rules and regulations relating to the services and to the preservation of public health and safety.

The Contractor shall ensure that it has developed and implemented policies and procedures relating to the health and safety of the services and, in addition, shall carry out training and enforcement to ensure that employees of the Contractor and any subcontractors know and follow the health and safety policies and procedures and shall ensure compliance with the Act, Regulations, Standards and Guidelines. The Contractor shall provide on request its health and safety policies and procedures to Conservation Halton for review prior to the commencement of the services.

The Contractor confirms that the appropriate health and safety instruction and training has been provided to its supervisors and employees. The Contractor shall maintain applicable records with respect to this instruction and training, which will include frequency and course content, and shall supply Conservation Halton with such records, as required or requested.

In the event the Contractor deems any of its material and/or equipment to be unsafe, it shall take remedial action and immediately notify Conservation Halton. The Contractor shall not leave Conservation Halton's property until steps have been taken to protect the workers and third parties from all hazards relating to the material and/or equipment.

Contractors or external vendors and consultants shall ensure that all of their personnel, (including all personnel of their subcontractors), who will be performing work indoors at a Conservation Halton ("CH") facility, have completed and submitted the Express Consent Form. The COVID-19 Vaccination Disclosure Form ("Consent Form" distributed by the associated CH business representative) and vaccine certificate will require forwarding to the CH Human Resources Department via email at [hr@hrca.on.ca](mailto:hr@hrca.on.ca) prior to the start of any work that is not performed remotely or exclusively outdoors.

The Contractor shall provide the Conservation Halton Representative with an account of safety activities, as required or requested, which shall include medical aids/lost time accidents, minutes of safety meetings, equipment inspections, etc.

The Contractor will maintain records of incidents and accidents and available statistics and shall supply the Conservation Halton Representative with such records and statistics, as required or requested.

The Contractor shall report all incidents and accidents to the Workplace Safety and Insurance Board and the Ministry of Labour, as applicable, and to Conservation Halton, as required or requested.

All critical injuries, fatalities and legislated incidents shall be reported to Conservation Halton immediately.

All incidents and accidents involving third parties shall be reported to Conservation Halton immediately.

If the Contractor is to enter Conservation Halton property where specific hazards exist, the Contractor and its supervisors and employees shall not enter until they are aware of and understand the hazards and have received applicable training, as required, in the hazards associated with the services.

The Contractor shall ensure that adequate levels of supervision are provided to ensure all safety aspects of the services. There shall be regular monitoring by the Contractor's supervisor(s) of the employees and the services. Conservation Halton shall have the right to require greater levels of supervision if the hazards related to the services are extreme or the levels of supervision are not, in the view of Conservation Halton, adequate.

The Contractor shall ensure that noise levels, duration of sound levels and measures taken shall be in accordance with the Regulations for Industrial Establishments.

### **2.30 Conservation Halton Representative's Authority**

The Conservation Halton Representative shall have the authority to see that the terms and conditions of this Agreement are adhered to and to give direction to remedy any violations of the Act, Regulations, Standards or Guidelines or to request the Contractor to cease services for non-compliance with the Agreement specifications, the terms and conditions of this Agreement or if any of the Contractor's workers or subcontractor's workers are deemed by Conservation Halton to be unacceptable because of incompetence, improper conduct, security risk or their disregard for the safety of others.

The Contractor shall allow the Conservation Halton Representative to access the place at which the services are being performed at all reasonable times and without any notice, in order that the Conservation Halton Representative may inspect the services and ensure compliance with the Act, Regulations, Standards and Guidelines.

### **2.31 Dispute Resolution**

Should any disputes arise in regard to this Agreement, Conservation Halton, while retaining the right to terminate this Agreement at any time as set out above, may follow the dispute resolution process set out below and/or as included within the amended CCDC supplemental general conditions, if CCDC is applicable to this tender:

#### **Step 1**

A verbal warning by a Conservation Halton Representative will be issued to the Contractor. The Conservation Halton Representative will outline the non-compliance with respect to the Specifications or any other requirements outlined in this Document Package. Conservation Halton reserves the right to hold back monies until the requirements have been met.

#### **Step 2**

If non-compliance continues, a written notice from the Conservation Halton Representative will be issued to the Contractor, stating the non-compliance and setting a time period for the Contractor to correct it and warning of cancellation should it not be corrected in the allotted time. A dollar value may be deducted from the

monthly invoice equal to the cost Conservation Halton has incurred to correct the problem.

**Step 3**

If the non-compliance continues beyond the time allotted in Step 2, a final letter from the Director, Finance will be issued stating final contract cancellation.

Notwithstanding this provision, Conservation Halton retains the right to terminate pursuant to section 1 above, any time during the dispute resolution process at its sole discretion.

**2.32 Liquidated Damages**

It is agreed by the parties to the Contract that in case all work called for under the Contract is not finished or completed and additional costs are incurred by Conservation Halton, the Contractor will reimburse Conservation Halton for the actual additional direct costs incurred.

Conservation Halton may deduct any amount due under this paragraph from any monies that may be due or payable to the Contractor on any account whatsoever. The liquidated damages payable under this paragraph are in addition to and without prejudice to any other remedy, action, or other alternative that may be available to Conservation Halton.

The Contractor shall not be assessed for liquidated damages for any delay caused by Acts of God, or of the Public Enemy, Acts of Government, Fire, Flood, Epidemics, Quarantines, Embargoes, Strikes or delays of Sub-Contractors due to such causes.

If the time available for completion of the work is increased or decreased by reason of alterations or changes made under the Contract, the number of working days shall be increased or decreased as determined by Conservation Halton.

**2.33 Halton Co-operative Purchasing Group**

Conservation Halton is a member of the Halton Co-operative Purchasing Group ("HCPG"), whose member agencies are Region of Halton, City of Burlington, Town of Oakville, Town of Milton, Town of Halton Hills, Halton District School Board, Halton Catholic District School Board, Oakville Public Library, Burlington Public Library, Halton Regional Police Services, Halton Children's Aid Society, Burlington Hydro, Oakville Hydro and Milton Hydro Electric Commission. Should any or all of the HCPG member agencies wish to acquire services at the same prices and under the same terms and conditions as the Contractor is providing to Conservation Halton under this Agreement, and provided that the Contractor agrees to provide such services to the HCPG member agencies, then each such member agency may make individual arrangements with the Contractor (e.g. by issuing a purchase order) and the terms and conditions of this Agreement shall apply as between the member agency and the Contractor.

**2.34 Invoicing**

All invoices will be sent to:

Conservation Halton  
2596 Britannia Road West  
Burlington ON L7P 0G3  
Attention: Accounts Payable

### **2.35 Entire Agreement**

Unless otherwise set out therein, the Document Package, which includes these terms and conditions, embodies the entire agreement of the parties.

### **2.36 Order of Precedence**

In the event of any conflicts or inconsistencies in the provisions of the plans and specifications of this document, such provisions shall take precedence and govern in the following order and in all cases; the original copy of the issued document and addendums, on file at Conservation Halton's offices shall prevail.

1. Supplementary Conditions to CCDC-2-2008
2. Form of Agreement – as noted in para 2.19
3. Addenda (where issued)
4. Special Provisions and/or General Requirements
5. Instructions to Bidders
6. Tender Specifications and Plans
7. Form of Tender and Supplementary Tender Form
8. General Conditions

### **2.37 Special Provisions**

Any Special Provisions attached to this Agreement are an integral part hereof.

### **2.38 By-Laws, Codes and Regulations**

The Contractor shall comply with all laws, regulations and amendments thereto. This obligation includes the requirement to comply with the Construction Lien Act and to maintain all necessary holdbacks.

Unless otherwise specified, the Contractor shall obtain and pay for all necessary permits, licences, certificates and inspections required for the execution of the services.

Where codes or regulations conflict, the more stringent shall govern.

The Contractor shall maintain a copy of each code or standard relating to the services, and agrees to produce such copy at the request of Conservation Halton.

### **2.39 Changes in the Services**

Conservation Halton may, without invalidating this Agreement, order changes by altering, adding to, or deducting from the services. Any increase or decrease shall result in an adjustment to the total Bid price.



The Contractor shall perform the services in accordance with such orders as if they had appeared in and been part of the original Agreement.

No changes shall be carried out by the Contractor unless authorized in writing by Conservation Halton.

Conservation Halton reserves the right to call competitive Bids for any work extra to this Agreement.

#### **2.40 Conservation Halton's Authority**

At any time, Conservation Halton may inspect any place where the Work is being performed, at all reasonable times and without prior notice, in order to ensure compliance to the Agreement.

All work performed under this Agreement will be performed to the satisfaction of Conservation Halton who shall be the sole arbiter in any dispute regarding the interpretation of the Agreement. Any decision of Conservation Halton shall be deemed to be binding and final.

#### **2.41 Warranty**

The Contractor represents and warrants that all of the written representations and warranties of the Contractor made in this Agreement, and any other agreement, instrument, document or written statement made or delivered pursuant to this Agreement, shall be true and correct in all material respects as at the time of the signing of the Front Cover Signature Sheet.

#### **2.42 Non-Merger**

The representations, warranties, covenants and agreements contained in this Agreement, and any other agreement, instrument, document or written statement made or delivered pursuant to this Agreement, shall survive and not merge on the termination of this Agreement.

#### **2.43 Notice**

Any notice required to be given under this Agreement may be given personally or by prepaid first class mail (in which case receipt shall be deemed to have occurred five (5) business days after the mailing thereof). Notice to the parties may be delivered at the following address:

Conservation Halton: 2596 Britannia Road West,  
Burlington, Ontario L7P 0G3

Contractor [Address and contact person as indicated on the Form of Tender]

#### **2.44 Further Assurances**

The Contractor and Conservation Halton agree that each of them shall and will, upon

the reasonable request of the other, make, do, execute, or cause to be made, done or executed, all such further and other lawful acts, deeds, things, devices and assurances whatsoever necessary to give effect to this Agreement, the terms and conditions contained herein.

#### **2.45 Conflict of Interest**

Where the Contractor, or anyone associated with the Contractor, has any pecuniary interest, direct or indirect, it shall forthwith disclose its interest where indicated in the Bidding System., and Conservation Halton shall have the exclusive right to terminate this Agreement thereafter should an undisclosed conflict be found at a later date.

#### **2.46 Severability**

In the event that any of the terms, conditions or provisions contained in this Agreement shall be determined invalid, unlawful or unenforceable to any extent, such term, condition, or provision shall be severed from the remaining terms, conditions and provisions which shall continue to be valid to the fullest extent permitted by law.

#### **2.47 Waiver**

The failure of Conservation Halton to insist in one or more instances upon the performance by the Contractor of any term or terms of this Agreement shall not be construed as a waiver of future performance of any such term or terms and the obligation of the Contractor with respect to such a future performance shall continue in full force and effect.

#### **2.48 Confidential Data**

The Contractor shall not at any time before, during or after the completion of the services divulge any confidential information communicated to or acquired by the Contractor or disclosed by Conservation Halton in the course of carrying out the services provided for herein. The Contractor shall use no such information before, during or after the completion of the services on any other project without the prior written consent of Conservation Halton.

End of Section 2

## **Section 3**

# **GENERAL CONDITIONS**

### **1.0 General Conditions**

The General Conditions of this Tender and construction contract shall be as set out in the General Conditions of the “Canadian Standard Construction Document CCDC 2 – 2008, Stipulated Price Contract”. The CCDC 2 document is not reproduced herein but will form the basis of the agreement between the Owner and the Contractor and the General Conditions embodied therein will apply to this contract in conjunction with Section 3 – General Conditions Supplemental.

End of Section 3

## **Section No. 4**

# **Supplemental General Conditions to CCDC-2-2008**

## SUPPLEMENTARY CONDITIONS

The Standard Construction Document CCDC-2 2008 for Stipulated Price Contract, English version, consisting of the Agreement Between *Owner* and *Contractor*, Definitions, and General Conditions of the Stipulated Price Contract, Parts 1 to 12 inclusive, governing same is hereby made part of these *Contract Documents*, with the following amendments, additions and modifications. These Supplementary Conditions have been developed by the Ontario Realty Corporation, with the endorsement of the Ontario General Contractors Association. Conservation Halton has chosen to adopt these Supplementary Conditions of their own validity:

## AGREEMENT BETWEEN OWNER AND CONTRACTOR

### ARTICLE A-3 – CONTRACT DOCUMENTS

3.1 Include in the list of *Contract Documents* in paragraph 3.1:

- tender document issued by the *Owner* in its entirety
- Supplementary Conditions
- Performance Bond
- Labour and Material Payment Bond
- Contractor Performance Policy and Sample Contractor Performance Assessment Report
- Project Specific Supplementary Conditions

### ARTICLE A-5 – PAYMENT

5.3.1 Delete paragraph 5.3.1 in its entirety and substitute new paragraph 5.3.1:

5.3 Interest

.1 Should either party fail to make payments as they become due under the terms of the *Contract* or in an award by arbitration or court, interest on such unpaid amounts shall also become due and payable from the date that is 30 calendar days after the date when the payment became due until payment at the rate established from time to time by the Minister of Finance (Ontario).

### ARTICLE A-9 – CONFLICT OF INTEREST

Add new Article A-9 – Conflict of Interest:

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

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

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

9.4 A breach of this Article by the *Contractor*, any of the *Subcontractors*, or any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall

entitle the *Owner* to terminate the *Contract*, in addition to any other rights and remedies that the *Owner* has in the *Contract*, in law, or in equity.

## ARTICLE A-10 – CONFIDENTIALITY

Add new Article A-10 – Confidentiality:

10.1 The *Contractor* agrees to ensure that it shall, both during or following the term of the *Contract*, maintain the confidentiality and security of all *Confidential Information* and *Personal Information*, and that it shall not directly or indirectly disclose, destroy, exploit, or use any *Confidential Information* or *Personal Information*, except where required by law, without first obtaining the written consent of the *Owner*. The *Contractor* may disclose any portion of the *Contract Documents* or any other information provided to the *Contractor* by the *Owner* to any *Subcontractor* or *Supplier* if the *Contractor* discloses only such information as is necessary to fulfill the purposes of the *Contract* and the *Contractor* has included a commensurate confidentiality provision in its contract with the

*Subcontractor* or *Supplier*. The *Contractor* acknowledges that it will comply with all requirements of the *Personal Information Protection and Electronic Documents Act*. The *Contractor* acknowledges that the *Owner* is bound by the provisions of the *Municipal Freedom of Information and Protection of Privacy Act* (“*MFIPPA*”). The *Contractor* further acknowledges that the *Owner* may be required to disclose any or all of the *Confidential Information* and *Personal Information* in the event that it is compelled to do so by law, through a request under *MFIPPA*, or by the rules of any applicable regulatory authority.

## DEFINITIONS

Add the following definitions:

### 0. As-Built Drawings

*As-Built Drawings* means the *Drawings* and *Specifications* revised by the *Contractor* during the *Work*, showing any and all changes or variations to the *Work* from the requirements of the *Drawings* and *Specifications*.

### 2a. Confidential Information

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

- 1) is or becomes generally available to the public without fault or breach on the part of the *Contractor*, including without limitation breach of any duty of confidentiality owed by the *Contractor* to the *Owner* or to any third party, but only after that information becomes generally available to the public;
- 2) the *Contractor* can demonstrate to have been rightfully obtained by the *Contractor* from a third party who had the right to transfer or disclose it to the *Contractor* free of any obligation of confidence;
- 3) the *Contractor* can demonstrate to have been rightfully known to or in the possession of the *Contractor* at the time of disclosure, free of any obligation of confidence; or
- 4) is independently developed by the *Contractor* without use of any *Confidential Information*.

## GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

**1.1** Where a General Condition or paragraph of the General Conditions of the Stipulated Price Contract is deleted by these Supplementary Conditions, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, and the numbering of the deleted item will be retained, unused.

### GC 1.1 CONTRACT DOCUMENTS

- .1 Add new sentence to the end of paragraph 1.1.6:

The *Specifications* are divided into divisions and sections for convenience but shall be read as a whole and neither such division nor anything else contained in the *Contract Documents* will be construed to place responsibility on the *Consultant* to settle disputes among the *Subcontractors* and *Suppliers* or as between them and the *Contractor* with respect to such divisions.

- .2 Add new subparagraph 1.1.7.5:

1.1.7.5 noted materials and annotations shall take precedence over graphic indications.

- .3 Delete paragraph 1.1.8 in its entirety and substitute new paragraph 1.1.8:

1.1.8 The *Owner* shall provide the *Contractor*, without charge, 6 copies of the *Contract Documents*.

### GC 1.3 RIGHTS AND REMEDIES

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

"Except with respect to the notice requirements set out in paragraphs 6.4.1, 6.5.4, and 6.6.1, no ...".

### GC 1.4 ASSIGNMENT

- .1 Delete paragraph 1.4.1 in its entirety and substitute new paragraph 1.4.1:

1.4.1 The *Owner* may assign the *Contract* or a portion thereof without the consent of the *Contractor*, where such assignment is to an entity undertaking the *Project* for the use of Conservation Halton. The *Contractor* may not assign the *Contract* or a portion thereof without the consent of the *Owner*, and the granting of such consent shall be in the *Owner's* discretion, not to be unreasonably withheld.

### GC 2.4 DEFECTIVE WORK

- .1 Add new subparagraphs 2.4.1.1 and 2.4.1.2:

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

2.4.1.2 When applicable, the *Contractor* shall give priority to the correction of any defective work or deficiencies which the *Owner* determines adversely affect its day-to-day operations.

### **GC 3.1 CONTROL OF THE WORK**

.1 Add new paragraph 3.1.3:

3.1.3 Prior to commencing the *Work*, the *Contractor* shall verify, at the *Place of the Work*, all relevant measurements and levels necessary for the proper completion of the *Work* and shall further carefully compare such field measurements and conditions with the requirements of the *Contract Documents*. Where dimensions are not included or exact locations are not apparent in the *Contract Documents*, the *Contractor* shall immediately notify the *Consultant* in writing and obtain *Supplemental Instructions* from the *Consultant* before proceeding with any part of the affected work.

### **GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS**

.1 Delete subparagraph 3.2.2.1 in its entirety

.2 Delete subparagraph 3.2.2.2 in its entirety

.3 Add new subparagraph 3.2.3.4:

3.2.3.4 Subject to General Condition 9.4 - CONSTRUCTION SAFETY, where paragraph 3.2.4 of General Condition 3.2 - CONSTRUCTION BY OWNER OR OTHER CONTRACTORS applies, for the *Owner's* own forces and for other contractors performing work identified in the *Contract Documents*, assume overall responsibility for compliance with all aspects of the applicable health and safety legislation in the *Place of the Work*, including all of the responsibilities of the constructor as that term is defined in the *Occupational Health and Safety Act*.

### **GC 3.4 DOCUMENT REVIEW**

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

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

.2 Add new paragraph 3.4.2:

3.4.2 If, at any time, the *Contractor* finds errors, inconsistencies, or omissions in the *Contract Documents* or has any doubt as to the meaning or intent of any part thereof, the *Contractor* shall immediately notify the *Consultant*, and request a *Supplemental Instruction*, *Change Order*, or *Change*



*Directive*, as the case may require. Neither the *Owner* nor the *Consultant* will be responsible for the consequences of any action of the *Contractor* based on oral instructions.

### **GC 3.5 CONSTRUCTION SCHEDULE**

- .1 Delete paragraph 3.5.1 in its entirety and substitute new paragraph 3.5.1:

3.5.1 The *Contractor* shall,

.1 prior to the first application for payment, prepare and submit to the *Owner* and the *Consultant* for their review and acceptance, a construction schedule that indicates the timing of the activities of the *Work* and provides sufficient detail of the critical events and their inter-relationship to demonstrate the *Work* will be performed in conformity with the *Contract Time* and in accordance with the *Contract Documents*. The *Contractor* shall employ construction scheduling software, where required by the *Specifications*, that permits the progress of the *Work* to be monitored in relation to the critical path established in the schedule. The *Contractor* shall provide the schedule and any successor or revised schedules in both electronic format and paper copy. Once accepted by the *Owner* and the *Consultant*, the construction schedule submitted by the *Contractor* shall become the baseline construction schedule;

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

.3 monitor the progress of the *Work* on a weekly basis relative to the baseline construction schedule, or any successor or revised schedule accepted by the *Owner* pursuant to General Condition 3.5 – CONSTRUCTION SCHEDULE, update the schedule on a monthly basis and advise the *Consultant* and the *Owner* in writing of any variation from the baseline or slippage in the schedule; and

.4 if, after applying the expertise and resources required under subparagraph 3.5.1.2, the *Contractor* forms the opinion that the variation or slippage in schedule reported pursuant to subparagraph 3.5.1.3 cannot be recovered by the *Contractor*, it shall, in the same notice, indicate to the *Consultant* and the *Owner* if the *Contractor* intends to apply for an extension of *Contract Time* as provided in PART 6 of the General Conditions - CHANGES IN THE WORK.

- .2 Add new paragraph 3.5.2:

3.5.2 If, at any time, it should appear to the *Owner* or the *Consultant* that the actual progress of the *Work* is behind schedule or is likely to become behind schedule, or if the *Contractor* has given notice of such to the *Owner* or the *Consultant* pursuant to subparagraph 3.5.1.3, the *Contractor* shall take appropriate steps to cause the actual progress of the *Work* to conform to the schedule or minimize the resulting delay and shall produce and present to the *Owner* and the *Consultant* a recovery plan demonstrating how the *Contractor* will achieve the recovery of the schedule. If the *Contractor* intends to apply for a change in the *Contract Price* in relation to a schedule recovery plan, then the *Contractor* shall proceed in accordance with General Condition 6.5 – DELAYS.

**GC 3.6 SUPERVISION**

- .1 Delete paragraph 3.6.1 in its entirety and substitute new paragraph 3.6.1:

3.6.1 The *Contractor* shall provide all necessary supervision and appoint competent representatives who shall be in attendance at the *Place of the Work* while work is being performed. The appointed representatives shall not be changed except for valid reasons, and upon the *Contractor* obtaining the *Owner's* written consent, which consent will not be unreasonably withheld.

- .2 Add new paragraph 3.6.3:

3.6.3 The *Owner* may, at any time during the course of the *Work*, request the replacement of the appointed representative(s), where the grounds for the request involve conduct which jeopardizes the safety and security of the site or the *Owner's* operations. Immediately upon receipt of the request, the *Contractor* shall make arrangements to appoint an acceptable replacement.

**GC 3.11 USE OF THE WORK**

- .1 Add new paragraph 3.11.3:

3.11.3 The *Contractor* shall abide by and enforce directives and policies regarding signs, advertisements, fires and smoking at the *Place of the Work* as directed by the *Owner*.

- .2 Add new General Conditions 3.14 and 3.15:

**GC 3.14 PERFORMANCE BY CONTRACTOR**

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

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

- .1 the personnel it assigns to the *Project* are appropriately experienced;
- .2 it has a sufficient staff of qualified and competent personnel to replace any of its appointed representatives, subject to the *Owner's* approval, in the event of death, incapacity, removal or resignation; and
- .3 there are no pending, threatened or anticipated claims that would have a material effect on the financial ability of the *Contractor* to perform its work under the *Contract*.

**GC 3.15 RIGHT OF ENTRY**

3.15.1 The *Owner* shall have the right to enter or occupy the *Work* in whole or in part for the purpose of placing fittings and equipment or for other uses before *Substantial Performance of the Work*, if, in the reasonable opinion of the *Consultant* and *Contractor*, such entry or occupation does not prevent or substantially interfere with the *Contractor's* completion of the *Contract* within the *Contract Time*. Such entry or occupation shall not be considered as acceptance of the *Work* or in any way relieve the *Contractor* from responsibility to complete the *Contract*.

**GC 4.1 CASH ALLOWANCES**

.1 Delete paragraph 4.1.4 in its entirety and substitute new paragraph 4.1.4:

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

.2 Delete paragraph 4.1.5 in its entirety and substitute new paragraph 4.1.5:

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

.3 Add new paragraph 4.1.8:

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

**GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER**

.1 Revise the heading, “**GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER**” to read, “**GC 5.1 FINANCING INFORMATION REQUIRED**”.

.2 Delete paragraph 5.1.1 in its entirety and substitute new paragraph 5.1.1:

5.1.1 The *Owner* and *Contractor* shall provide each other with timely *Notice in Writing* of any material change in their financial ability to fulfil their respective obligations under the *Contract*.

.3 Delete paragraph 5.1.2 in its entirety.

**GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT**

- .1 Add to the end of paragraph 5.2.7 the following new sentence:

Any *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work* shall remain at the risk of the *Contractor* notwithstanding that title has passed to the *Owner* pursuant to General Condition 13.1 - OWNERSHIP OF MATERIALS.

- .2 Add new paragraphs 5.2.8, 5.2.9, and 5.2.10:

5.2.8 As a condition of receiving each progress payment after the first, the *Contractor* shall submit a Statutory Declaration on an original form CCDC Document 9A-2001, attesting to the truth of the statements made therein.

5.2.9 The *Contractor* shall submit a Workplace Safety & Insurance Board Clearance Certificate with each application for progress payment.

5.2.10 The *Contractor* shall prepare current *As-Built Drawings* during the course of the *Work*, which current *As-Built Drawings* shall be maintained by the *Contractor* and made available to the *Consultant* for review with each application for progress payment. The *Consultant* shall retain a reasonable amount from any progress payment for the value of the *As-Built Drawings* not presented for review.

**GC 5.3 PROGRESS PAYMENT**

- .1 Delete subparagraph 5.3.1.3 in its entirety and substitute new subparagraph 5.3.1.3:

.3 the *Owner* shall make payment to the *Contractor* on account as provided in Article A-5 of the Agreement – PAYMENT no later than 45 calendar days after the date of a certificate of payment issued by the *Consultant*

**GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK**

- .1 Delete paragraph 5.4.3 in its entirety and substitute new paragraph 5.4.3:

5.4.3 Immediately prior to the issuance of the certificate of *Substantial Performance of the Work*, the *Contractor*, in consultation with the *Consultant*, shall establish reasonable dates for finishing the *Work* and correcting deficiencies.

- .2 Add new paragraphs 5.4.4, 5.4.5, 5.4.6, and 5.4.7:

5.4.4 Within 7 calendar days of receiving a copy of the certificate of *Substantial Performance of the Work* signed by the *Consultant*, the *Contractor* shall publish a copy of the certificate in a construction trade newspaper (as that term is defined in the *Construction Lien Act*) and shall provide to the *Consultant* and the *Owner* the date of publication and the name of the construction trade newspaper in which the publication occurred. If the *Contractor* fails to comply with this provision, the *Owner* may publish a copy of the certificate and charge the *Contractor* with the costs so incurred.

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

- .1 guarantees;
- .2 warranties;
- .3 certificates;
- .4 testing and balancing reports;
- .5 distribution system diagrams;
- .6 spare parts;
- .7 maintenance manuals;
- .8 samples;
- .9 existing reports and correspondence from authorities having jurisdiction in the *Place of the Work*;

and other materials or documentation required to be submitted under the *Contract*, together with written proof acceptable to the *Owner* and the *Consultant* that the *Work* has been substantially performed in conformance with the requirements of municipal, governmental, and utility authorities having jurisdiction in the *Place of the Work*.

5.4.6 Where the *Contractor* is unable to deliver the documents and materials described in paragraph 5.4.5, then, provided that none of the missing documents and materials interferes with the use and occupancy of the *Project* in a material way, the failure to deliver shall not be grounds for the *Consultant* to refuse to certify *Substantial Performance of the Work*. If the *Contractor* fails to deliver any of the materials required in subparagraphs 5.4.5.7 or 5.4.5.8, the *Consultant* may retain a reasonable amount or, where applicable, the amount specified in the Project Specific Supplementary Conditions from the payment of holdback under General Condition 5.5 - PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK. Should any documents or materials not be delivered in accordance with paragraph 5.4.5 by the earlier of 60 days following publication of the certificate of *Substantial Performance of the Work* and the submission of the *Contractor's* application for final payment under paragraph 5.7.1 of General Condition 5.7 – FINAL PAYMENT, then the amount previously retained pursuant to this provision shall be forfeit to the *Owner* as compensation for the damages deemed to have been incurred by the *Owner*, and not as a penalty, arising from the failure to deliver the documents or materials, and the *Contract Price* shall be reduced accordingly.

5.4.7 Together with the submission of its written application for *Substantial Performance of the Work*, the *Contractor* shall submit to the *Consultant* and to the *Owner* a statutory declaration setting forth in reasonable detail any then outstanding and unresolved disputes or claims between the *Contractor* and any *Subcontractor* or *Supplier*, including any claims allegedly arising from delay, which are, directly or indirectly, related to any then outstanding or anticipated disputes or claims between the *Contractor* and the *Owner*, and this disclosure shall, at a minimum:

- .1 identify the parties involved;
- .2 identify the amount in dispute;
- .3 provide a brief statement summarizing the position of each party;
- .4 include copies of any correspondence or documents in support of either party's position;
- .5 include copies of any documents of any court or arbitration process related to the matter;
- .6 identify the dispute or claim between the *Contractor* and the *Owner* to which the matter relates; and
- .7 include a copy of any written agreement or a summary of any oral agreement between the parties related to resolution of the matter.

The disclosure requirements detailed herein are of a continuing nature and survive completion of the *Work*. Accordingly, the *Contractor* shall supplement the information provided with the original statutory declaration with additional materials pertaining to new or existing disputes or claims, as they become available. The *Contractor* shall not be entitled to recover from the *Owner* any amount pertaining to any claim or dispute referred to in this paragraph, if the provisions of this paragraph have not been fully complied with. For greater certainty, the *Contractor* is not obliged to make the aforementioned disclosure with respect to any dispute or claim that is not related to or does not touch upon any then outstanding and unresolved dispute or claim between the *Contractor* and the *Owner*.

## **GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK**

- .1 Add new subparagraph 5.5.1.3:

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

- .2 Delete from line 1 of paragraph 5.5.2, the words, “the statement” and substitute the words:

“the documents”.

- .3 Delete paragraph 5.5.3 in its entirety.

**GC 5.7 FINAL PAYMENT**

- .1 Delete paragraph 5.7.1 in its entirety and substitute new paragraph 5.7.1:

5.7.1 When the *Contractor* considers that the *Work* is completed, the *Contractor* shall submit an application for final payment. The *Contractor's* application for final payment shall be accompanied by any documents or materials not yet delivered pursuant to paragraph 5.4.5. The *Work* shall be deemed not to be performed until all of the aforementioned documents have been delivered.

- .2 Delete from the first line of paragraph 5.7.2 the words, “calendar days” and substitute the words:

“*Working Days*”.

- .3 Delete from the second line of paragraph 5.7.4 the words, “calendar days” and substitute the words:

“*Working Days*”.

- .4 Add new paragraph 5.7.5:

5.7.5 Prior to the release of the finishing holdback provided for under the *Construction Lien Act*, the *Contractor* shall submit:

- .1 *Contractor's* written request for release of the finishing holdback, including a statement that no written notices of lien have been received by it;
- .2 a Statutory Declaration CCDC 9A-2001;
- .3 a final Workplace Safety & Insurance Board Clearance Certificate.

**GC 6.2 CHANGE ORDER**

- .1 Add new paragraph

**6.2.3** The *Contractor* will be allowed 5% overhead and 5% profit on *work* completed by *subcontractors*. The *Contractor* will be allowed 10% overhead and 5% profit on the *Contractors* own work.

**GC 6.3 CHANGE DIRECTIVE**

- .1 Delete subparagraph 6.3.7.1(1) and replace it with:

“(1) carrying out the work, including necessary supervisory services;”

- .2 Delete subparagraph 6.3.7.1(2) and replace it with

“(2) intentionally left blank.”

- .3 Amend subparagraph 6.3.7.1(3) so that, as amended, it reads:

“(3) engaged in the preparation of *Shop Drawings*, fabrication drawings, coordination drawings and *As-Built Drawings*: or...”

.4 Amend subparagraph 6.3.7.1(4) so that, as amended, it reads:

“(4) including clerical staff engaged in processing changes in the *Work*.”

#### **GC 6.4 CONCEALED OR UNKNOWN CONDITIONS**

.1 Add new paragraph 6.4.5:

6.4.5 If the *Contractor* was given access to the *Place of the Work* prior to the submission of the bid on which the *Contract* was awarded, then the *Contractor* confirms that it carefully investigated the *Place of the Work* and, in doing so, applied to that investigation the degree of care and skill required by paragraph 3.14.1. In those circumstances, notwithstanding the provisions of paragraph 6.4.1, the *Contractor* is not entitled to an adjustment to the *Contract Price* or to an extension of the *Contract Time* for conditions which could reasonably have been ascertained by the *Contractor* by such careful investigation, or which could have been reasonably inferred from the material provided with the *Contract Documents*. In those circumstances, should a claim arise, the *Contractor* will have the burden of establishing that it could not have discovered the materially different conditions from a careful investigation, because of restrictions placed on its access or inferred the existence of the conditions from the material provided with the *Contract Documents*.

#### **GC 6.5 DELAYS**

.1 Delete the period at the end of paragraph 6.5.1, and substitute the following words:

“, but excluding any consequential, indirect or special damages.”

.2 Delete the period at the end of paragraph 6.5.2, and substitute the following words:

“, but excluding any consequential, indirect or special damages.”

.3 Add new paragraph 6.5.6.

6.5.6 If the *Contractor* is delayed in the performance of the *Work* by an act or omission of the *Contractor* or anyone directly or indirectly employed or engaged by the *Contractor*, or by any cause within the *Contractor's* control, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may decide in consultation with the *Contractor*. The *Owner* shall be reimbursed by the *Contractor* for all reasonable costs incurred by the *Owner* as the result of such delay, including, but not limited to, the cost of all additional services required by the *Owner* from the *Consultant* or any subconsultants, project managers, or others employed or engaged by the *Owner*.

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

.1 Revise the heading, “**OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT**” to read, “**OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE**



**CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT”**

.2 Delete paragraph 7.1.6 and add new paragraphs 7.1.6, 7.1.7, 7.1.8, 7.1.9, 7.1.10, and 7.1.11:

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

7.1.7 The *Owner* may suspend *Work* under this *Contract* at any time for any reason and without cause upon giving the *Contractor Notice in Writing* to that effect. In such event, the *Contractor* shall be entitled to be paid for all *Work* performed to the date of suspension and be compensated for all actual costs incurred arising from the suspension, including reasonable profit, for loss sustained upon *Products* and *Construction Equipment*, and such other damages as the *Contractor* may have sustained as a result of the suspension of the *Work*, but in no event shall the *Contractor* be entitled to be compensated for any indirect, special, or consequential damages incurred. In the event that the suspension continues for more than 180 calendar days, the *Contract* shall be deemed to be terminated and the provisions of paragraph 7.1.6 shall apply.

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

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

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

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

.1 Delete paragraph 7.2.2 in its entirety.

.2 Delete subparagraph 7.2.3.1 in its entirety.

- .3 Delete subparagraph 7.2.3.3 in its entirety and substitute new subparagraph 7.2.3.3:

7.2.3.3 the *Owner* fails to pay the *Contractor* when due the amount certified by the *Consultant* or awarded by arbitration or a court, except where the *Owner* has a bona fide claim for set off, or

- .4 Delete from subparagraph 7.2.3.4, the words:

", except for General Condition 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER,"

- .5 Delete from the end of paragraph 7.2.4 the words "or terminate the *Contract*" and substitute the words:

"until the default is corrected, provided, however, that in the event of such suspension, the provisions of subparagraph 7.1.10 shall apply. If the *Contractor's Notice in Writing* to the *Owner* was given pursuant to subparagraph 7.2.3.3, then, 180 days after the delivery of the *Notice in Writing*, the *Contractor* may terminate the *Contract*, provided, however, that in the event of such termination, the provisions of subparagraph 7.1.10 shall apply."

## **GC 8.1 AUTHORITY OF THE CONSULTANT**

- .1 Delete last sentence of 8.1.3 and substitute the following sentence:

If it is subsequently determined that such instructions were at variance with the *Contract Documents*, the *Owner* shall pay the *Contractor* costs incurred by the *Contractor* in carrying out such instructions which the *Contractor* was required to do beyond the requirements of the *Contract Documents*, including costs resulting from interruption of the *Work*.

## **GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION**

- .1 Delete paragraphs 8.2.6, 8.2.7, and 8.2.8 in their entirety and substitute new subparagraph 8.2.6:

8.2.6 When a dispute has not been resolved through negotiation or mediation, within 10 *Working Days* after the date of termination of the mediated negotiations under paragraph 8.2.5, either party may give a *Notice in Writing* to the other party and to the *Consultant* inviting the other party to agree to submit the dispute to be finally resolved by arbitration, pursuant to provisions of the *Arbitration Act, 1991*. If the other party wishes to accept the invitation to submit the dispute to arbitration, it shall so indicate by the delivery of a responding *Notice in Writing* within 10 *Working Days* of receipt of the invitation. If, within the required times, no invitation is made or, if made, is not accepted, either party may refer the dispute to the courts or to any other form of dispute resolution, including arbitration, which the parties may agree to use.

## **GC 9.1 PROTECTION OF WORK AND PROPERTY**

- .1 Delete subparagraph 9.1.1.1 in its entirety and substitute new subparagraph 9.1.1.1:

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

.2 Delete paragraph 9.1.2 in its entirety and substitute the following new paragraph 9.1.2:

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

.3 Add new paragraph 9.1.5:

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

## **GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES**

.1 Delete subparagraph 9.2.7.4 in its entirety.

.2 Add to subparagraph 9.2.8.3 immediately before the comma, the following new words:

"and as a result of the delay"

## **GC 9.4 CONSTRUCTION SAFETY**

.1 Delete paragraph 9.4.1 in its entirety and substitute new paragraph 9.4.1

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

.2 Add new paragraphs 9.4.2, 9.4.3 and 9.4.4:

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

.1 a current Workplace Safety & Insurance Board Clearance Certificate;

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

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

.4 a copy of the Notice of Project filed with the Ministry of Labour naming itself as "constructor" under the *Occupational Health and Safety Act*.

9.4.3 The *Contractor* shall indemnify and save harmless the *Owner*, its agents, officers, directors, employees, consultants, successors, appointees, and assigns from and against the consequences of any and all safety infractions committed by the *Contractor* under the *Occupational Health and Safety Act*, including the payment of legal fees and disbursements on a solicitor and client basis. Such indemnity shall apply to the extent to which the *Owner* is not covered by insurance, provided that the indemnity contained in this paragraph shall be limited to costs and damages resulting directly from such infractions and shall not extend to any consequential, indirect or special damages.

9.4.4 The *Owner* undertakes to include in its contracts with other contractors and in its instructions to its own forces the requirement that the other contractor or its own forces, as the case may be, comply with the policies and procedures of and the directions and instructions from the *Contractor* with respect to occupational health and safety and related matters. Prior to admission to the *Place of the Work*, the *Contractor* may, as a condition of admission, require any other contractor or the *Owner's* own forces to sign a written acknowledgement in the following form:

### **Acknowledgement**

The undersigned acknowledges that the *Work* it will perform on behalf of the *Owner* requires it to enter a *Place of the Work* which is under the total control of a *Contractor* that has a *Contract* with the *Owner*, pursuant to which the *Contractor* has assumed overall responsibility for compliance with all aspects of the applicable health and safety legislation, including all the responsibilities of the "constructor" under the *Occupational Health and Safety Act*, as well as responsibility to co-ordinate and schedule the activities of our *Work* with the *Work* of the *Contractor* under its *Contract*. The undersigned agrees to comply with the *Contractor's* directions and instructions with respect to health, safety, co-ordination, and scheduling and acknowledges that its failure to do so will be cause for termination of employment or of the undersigned's *Contract* with the *Owner*, as the case may be. The undersigned also agrees to have the *Contractor* named as an additional insured on any comprehensive liability insurance policy, where such insurance is required.

---

Name:

Title:

Date:

### **GC 9.5 MOULD**

- .1 Add to subparagraph 9.5.2.3 immediately before the comma, the following new words:

"and as a result of the delay"

- .2 Delete subparagraph 9.5.3.4 in its entirety.

### **GC 10.1 TAXES AND DUTIES**

- .1 Add new paragraph 10.1.3:

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

## **GC 10.2 LAWS, NOTICES, PERMITS, AND FEES**

.1 Add to the end of paragraph 10.2.4 the following words:

" The *Contractor* shall notify the Chief Building Official or the registered code agency, where applicable, of the readiness, substantial completion, and completion of the stages of construction set out in the *Ontario Building Code*. The *Contractor* shall be present at each site inspection by an inspector or registered code agency. If any laws, ordinances, rules, regulations, or codes conflict, the more stringent shall govern."

.2 Delete from the first line of paragraph 10.2.5 the word, "The" and substitute the words:

"Subject to paragraph 3.4.1, the".

## **GC 10.3 PATENT FEES**

.1 Delete paragraph 10.3.2 in its entirety.

## **GC 10.4 WORKERS' COMPENSATION**

.1 Add to subparagraph 10.4.1 immediately after the first comma, the following new words:

"again with each application for progress payment, and"

.2 Add to the beginning of subparagraph 10.4.2 the following new words:

"The *Contractor* shall ensure that each *Subcontractor* complies with the workers' compensation legislation at the *Place of the Work*. "

## **GC 11.1 INSURANCE**

.1 Add new subparagraph 11.1.1.6(4):

11.1.1.6(4) If any loss occurs involving damage to property in an amount greater than \$25,000, bodily injury to any person, or damage to any existing structure, the *Contractor* shall, in addition to the other requirements set out herein, immediately provide a detailed written report to the *Owner*.

- .2 Delete paragraph 11.1.2 in its entirety and substitute new paragraph 11.1.2:

11.1.2 In all instances in paragraph 11.1.1 where the *Contractor* is required to obtain insurance coverages naming or jointly naming the *Owner*, such policies shall also name the Region of Halton. Each of the policies of insurance shall also contain a provision requiring not less than 30 days' written notice to each named insured prior to cancellation or any change that would reduce coverage. At least 10 calendar days prior to commencement of the *Work* and upon any renewal, amendment, or extension of all or any part of the insurance, the *Contractor* shall promptly provide the *Owner* with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any amending endorsements applicable to the *Work*.

- .3 Add new subparagraph 11.1.9:

11.1.9 The parenthetical reference in CCDC 41 - INSURANCE REQUIREMENTS, paragraph 4 which reads: "(excluding flood and earthquake)" is deleted and replaced with the following: "(including flood, earthquake, testing, and commissioning)".

## **GC 11.2 CONTRACT SECURITY**

- .1 Delete paragraph 11.2.1 in its entirety and substitute new paragraph 11.2.1:

11.2.1 The *Contractor* shall, prior to commencement of the *Work*, provide to the *Owner*:

.1 a performance bond, in the form set out in the *Contract Documents*, in an amount equal to 100% of the *Contract Price*, covering the performance of the *Contract*, including the *Contractor's* requirements with respect to the correction of deficiencies and the fulfillment of all warranties; and

.2 a labour and material payment bond, in the form set out in the *Contract Documents*, in an amount equal to 50% of the *Contract Price* covering payment for labour, *Product*, or both.

- .2 Delete paragraph 11.2.2 in its entirety and substitute new paragraph 11.2.2:

11.2.2 The bonds referred to in paragraph 11.2.1 shall be issued by a duly licensed surety company authorized to transact the business of suretyship in the province or territory of the *Place of the Work* and shall be maintained in good standing until the fulfillment of the *Contract*.

**GC 12.1 INDEMNIFICATION**

- .1 Delete General Condition 12.1 – INDEMNIFICATION in its entirety and substitute:

12.1 The *Contractor* shall indemnify and hold harmless, the *Owner*, the *Consultant*, and their respective agents, appointees, directors, officers and employees from and against claims, demands, losses, expenses, costs, damages, actions, suits or proceedings that arise out of or are attributable to the *Contractor's* performance of the *Contract*. Nothing in this paragraph 12.1, shall limit any claim that the *Owner* may have under the insurance coverage to be provided under General Condition 11.1 - INSURANCE.

**GC 12.2 WAIVER OF CLAIMS**

- .1 Delete the reference to "395 calendar days" in the last line of paragraph 12.2.2 and substitute "120 calendar days".

- .2 Delete the last sentence of subparagraph 12.2.3.4 and substitute:

"Substantial defects or deficiencies" mean those defects or deficiencies in the *Work* where the reasonable cost of repair of such defects or deficiencies exceeds:

- .1 if the *Contract Price* is \$2 million or less, the sum of \$50,000, before GST;
- .2 if the *Contract Price* exceeds \$2 million, the sum of \$100,000, before GST;

but, in any event, a defect or deficiency in the *Work* which affects the *Work* to such an extent or in such a manner that a significant part or the whole of the *Work* is unfit for the purpose intended by the *Contract Documents* shall be deemed to be a "substantial defects or deficiencies" regardless of the cost of repair.

- .2 Amend paragraph 12.2.5 by adding ",12.2.3.4" immediately after the reference to paragraph 12.2.3.3.

**GC 12.3 WARRANTY**

- .1 Delete from the first line of paragraph 12.3.2 the word, "The" and substitute the words:

"Subject to paragraph 3.4.1, the...".

**Add new PART 13 as follows:****PART 13 OTHER PROVISIONS****GC 13.1 OWNERSHIP OF MATERIALS**

13.1.1 All *Work* and *Products* delivered to the *Place of the Work* by the *Contractor* shall be the property of the *Owner*. The *Contractor* shall remove all surplus or rejected materials when notified in writing to do so by the *Consultant*.

**GC 13.2 CONSTRUCTION LIENS**

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

- .1 within 10 calendar days, ensure that any and all claims for lien and certificates of action are discharged, released, or vacated by the posting of security or otherwise; and
- .2 in the case of written notices of lien, ensure that such notices are withdrawn, in writing.

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

**GC 13.3 CONTRACTOR DISCHARGE OF LIABILITIES**

13.3.1 In addition to the obligations assumed by the *Contractor* pursuant to General Condition 3.7 – SUBCONTRACTORS AND SUPPLIERS, the *Contractor* agrees to discharge all liabilities incurred by it for labour, materials, services, *Subcontractors* and *Products*, used or reasonably required for use in the performance of the *Work*, except for amounts withheld by reason of legitimate dispute which have been identified to the party or parties, from whom payment has been withheld.



**GC 13.4 RECORDS/DAILY REPORTS/DAILY LOGS**

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13.4.1 The *Contractor* shall maintain and keep accurate *Project* records (which means all tangible records, documents, computer printouts, electronic information, books, plans, *Drawings*, *Specifications*, accounts or other information relating to the *Work*) in its office in Ontario in accordance with requirements of law, but in any event for not less than 6 years from *Substantial Performance of the Work* or until all claims have been settled. During this time, the *Contractor* shall allow the *Owner* access to the *Project* records during normal business hours upon the giving of reasonable notice. The *Contractor* shall ensure that equivalent provisions to those provided herein are made in each subcontract and shall require the *Subcontractors* and *Suppliers* to incorporate them into every level of contract thereunder for any part of the *Work*.

END OF DOCUMENT

## **Section No. 5**

# **SPECIAL PROVISIONS**

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## **5.1 Purpose and Intent**

As part of Conservation Halton's Master Plan, we are tendering works to improve access to our pedestrian bridge over CP rail lines at Kelso Conservation Area, Milton. Tenders are invited for all works related to Drawings and Specifications provided by Red Studio Architects.

The award of the contract shall be based not only on price but also on proposed work schedule and accommodating measures that will minimize disruption to normal business operations.

## **5.2 Description of Works by Contractor**

All works shall be included as per Drawings and Specifications by Red Studio Architects. Contractor shall also make good all interior/exterior existing abutting surfaces with all necessary trim, caulking, paint, etc. to provide complete finished job.

## **5.3 Responsibilities of Conservation Halton**

- 5.3.1 Conservation Halton shall indicate specific work area and material lay down area to be fenced off.
- 5.3.2 Conservation Halton can provide washroom facilities provided facilities are maintained in suitable manner by contractor.

## **5.4 Construction Schedule**

- 5.4.1 Tender approval and contractor award to take place tentatively June 20<sup>th</sup>, 2025. Initial construction start-up meeting with CH Project Manager shall take place within the following 2-3 weeks of contract award.
- 5.4.2 Within 10 days following contract award, the contractor will submit a detailed construction schedule to Conservation Halton in accordance with the construction start date and proposed weeks of work as provided by the bidder in the tender submission.
- 5.4.3 Timing and coordination is critical to the successful implementation of this project in order to minimize guest disruption. Pending unavoidable circumstances, the contractor will be expected to execute said works in a continuous and expeditious manner until all works are completed.

## **5.5 Specified Work Periods**

- 5.5.1 Normal construction working hours shall be permitted between the hours of 7:00 a.m. – 6:00 p.m. daily, Monday through Friday in accordance with contractors approved work schedule or upon 24-hour notification and approval of CH Project Manager. The Contractor shall refrain from work on Sundays or days that are legal holidays in Ontario.
- 5.5.2 Extended working hours access may be provided to the contractor between the hours of 6:00 a.m. to 9:00 p.m. or on Saturdays upon contractor's request and agreement of Conservation Halton at the project start-up meeting or with 48-hours request notice and approval of CH Project Manager.

## **5.6 Project Meetings**

As per specifications.

## **5.7 Permitting**

5.7.1 Conservation Halton's Consultant (Red Studio Architects) shall be responsible to obtain all building permit approvals.

5.7.2 The contractor shall submit "Notice of Project" to the Ministry of Labour (MOL) as the project "Constructor" and similarly shall submit registration of "Constructor" and any subcontractors to be employed on the site to the MOL with site postings as per MOL requirements.

## **5.8 Location and Protection of Utilities, Structures and Properties**

5.8.1 Prior to construction commencement the contractor shall meet on-site with the CH Construction Coordinator to review and verify the locations of existing services to be maintained or abandoned prior to commencement of constructions.

5.8.2 Contractor responsible for providing locates at their own expense.

5.8.3 Where unknown services are encountered, immediately advise the CH Project Manager and confirm findings in writing.

## **5.9 Disposal of Waste Materials and Clean-up**

5.9.1 The contractor shall be responsible for disposal of all construction and waste materials in accordance with standard local requirements.

5.9.2 The contractor shall be responsible for maintaining a clean work site and final clean-up of any construction debris, dirt or dust resultant from construction within the vicinity or immediately outside the work area.

## **5.10 Performance Specifications**

As per specifications.

## **5.11 Quality Control/Quality Assurance**

5.11.1 All work shall be completed in a manner to the satisfaction of CH Project Manager.

## **5.12 Site Amenities**

5.12.1 Parking of contractor vehicles or equipment shall occur in the designated work area in the adjacent parking lot.

## **5.13 Conservation Halton Project Management Team**

Bi-weekly project construction meetings with the contractor may include any or all of the following Conservation Halton staff, consultants or their designates:

- Brian Coombs, Project Manager
- Justin Silva, Senior Manager Operations
- Red Studio Architects

## **5.14 Construction Questions**

General questions relating to the Arrival Centre shall be directed to Justin Silva (jsilva@hrca.on.ca)

## **Section No. 6**

# **SPECIFICATIONS**

# KELSO ARRIVAL CENTRE

5234 KELSO ROAD  
MILTON, ONTARIO  
L9E 0C5

APRIL 17, 2025

ARCHITECTURAL SPECIFICATIONS

# RED

0



## **PROJECT TEAM**

---

### **PROJECT:**

**KELSO ARRIVAL CENTRE**  
**5234 Kelso Rd,**  
**Milton, Ontario**  
**L9E 0C6**

### **PROJECT MANAGER:**

**CONSERVATION HALTON**  
Brian Coombs  
bcoombs@hrca.on.ca

T. 905-208-1032

### **CONSULTANTS:**

**RED STUDIO INC. ARCHITECTS**  
354 Davenport Road, Suite 300  
Toronto, Ontario  
M5R 1K6  
Antonio Santini, OAA, MRAIC, LFA, LEED AP, MEDes  
Project Architect

T.416.962.1996

**ESTI CONSULTANTS INC.**  
214 Merton Street, Suite 202  
Toronto, Ontario  
M4S 1A6  
Eric Wong, P.Eng, Mechanical Engineer

T. 416-847-1200 ex 201

**MULVEY & BANANI INTERNATIONAL INC.**  
90 Sheppard Ave E  
Toronto, Ontario  
M2N 3A1  
Brett Francis, P.Eng, Electrical Engineer

T. 416-751-2122 ex 305

**ENGINEERING LINK INC.**  
375 University Ave, Suite 901  
Toronto, Ontario  
M5G 2J5  
Craig Nicoletti, P.Eng, Structural Engineer

T. 416-599-5465 ex 128

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**END OF TABLE OF CONTENTS**

## CONSTRUCTION WASTE MANAGEMENT REPORTING FORM

1

COMPANY NAME:	CONTACT PERSON:	PHONE:
---------------	-----------------	--------

MATERIAL <sup>2</sup>	PRE-PROJECT ESTIMATED GENERATION <sup>3</sup>	PROJECT UPDATES			FACILITY <sup>5</sup> (ADDITIONAL COMMENTS)
		FOR PERIOD:	TO:		
		ACTUAL GENERATION <sup>4</sup>	RECYCLED / SALVAGED / DISPOSED		
			<input type="checkbox"/> RECYCLED <input type="checkbox"/> SALVAGED <input type="checkbox"/> DISPOSED		
			<input type="checkbox"/> RECYCLED <input type="checkbox"/> SALVAGED <input type="checkbox"/> DISPOSED		
			<input type="checkbox"/> RECYCLED <input type="checkbox"/> SALVAGED <input type="checkbox"/> DISPOSED		
			<input type="checkbox"/> RECYCLED <input type="checkbox"/> SALVAGED <input type="checkbox"/> DISPOSED		
			<input type="checkbox"/> RECYCLED <input type="checkbox"/> SALVAGED <input type="checkbox"/> DISPOSED		
			<input type="checkbox"/> RECYCLED <input type="checkbox"/> SALVAGED <input type="checkbox"/> DISPOSED		
			<input type="checkbox"/> RECYCLED <input type="checkbox"/> SALVAGED <input type="checkbox"/> DISPOSED		

I declare that this report is accurate to the best of my knowledge.

SIGNATURE:	TITLE:	DATE:
------------	--------	-------

### Explanatory Notes:

- <sup>1</sup> Complete this form on biweekly basis during demolition and construction activities. Submit to the project manager or designated waste management coordinator. All contractors are expected to minimize waste going to the landfill and maximize recycling and salvage opportunities.
- <sup>2</sup> Divide materials to greatest extent possible into different waste categories, i.e. glass, metal, paper, cardboard, wood, drywall, and hazardous materials. All material types, including mixed wastes, to be included.
- <sup>3</sup> Indicate weights in metric tonnes. Where weight information is not available provide volumes.
- <sup>4</sup> Use this column to list weights of materials that did NOT end up as waste in the landfill.
- <sup>5</sup> Provide names of facilities receiving waste and/or recycled products. Provide an appendix with details of the facilities including name, location, address, phone number, and contact person.

END OF SECTION

## SUBSTITUTION REQUEST FORM

---

- .1 Complete the following for each material proposed:
- .1 Request for Substitution Number (RFS): \_\_\_\_\_
  - .2 Specification Section Number: \_\_\_\_\_
  - .3 Specified Product:
    - .1 Manufacturer: \_\_\_\_\_
    - .2 Product Name or Material: \_\_\_\_\_
  - .4 Proposed Substitute Product:
    - .1 Manufacturer: \_\_\_\_\_
    - .2 Product Name or Material: \_\_\_\_\_
    - .3 Manufacturer Telephone No: \_\_\_\_\_

### REASON FOR SUBSTITUTION

- .1 Specified products (all specified products) are not available (no longer manufactured).  
Were Manufacturers Contacted? Yes: \_\_\_\_\_. No: \_\_\_\_\_.  
If yes, provide telephone number and name of contact:
  - .1 Name: \_\_\_\_\_
  - .2 Telephone No: \_\_\_\_\_
  - .3 If no, provide reason for not contacting specified manufacturers. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- .2 Less than three manufacturers have been specified.  
Were Manufacturers Contacted? Yes: \_\_\_\_\_. No: \_\_\_\_\_.  
If yes, provide telephone number and name of contact:
  - .1 Name: \_\_\_\_\_
  - .2 Telephone No: \_\_\_\_\_
  - .3 If no, provide reason for not contacting specified manufacturers. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- .3

## SUBSTITUTION REQUEST FORM

---

- .4 Substitution would be in the best interest of the Owner.
- .1 Provide an explanation of how the substitution would be in the best interest of the Owner.
- \_\_\_\_\_
- \_\_\_\_\_
- .2 Time Savings to Owner: Project to be complete \_\_\_\_\_ days earlier than Contract Date of Substantial Completion.
- .3 Cost Savings to Owner: Owner to deduct \$ \_\_\_\_\_ from base bid price.

### CONTRACTOR'S REPRESENTATION

- .1 Contractor: The undersigned acknowledges the following.
- .1 The above information has been verified by the Contractor.
- .2 The above information meets the requirements of Section 01 25 00 Product Substitutions.
- .3 Supporting data is complete and provided with this Substitution Request Form in compliance with Section 01 25 00 Product Substitutions.
- .4 The proposed substituted product provides the same warranties and or bonds as specified product.
- .5 The installation of an accepted substitution into the Work will be coordinated with other trades. Changes to the Work are complete in all respects.
- .6 The Contractor waives all claims for additional costs related to the substitution which may subsequently become apparent.
- .7 Provide side by side comparison of product performance data with this form.

### CONSULTANT'S RECOMMENDATION

- .1 Consultant's Recommendation: The undersigned acknowledges the following.
- .1 Reason for Substitution: Conforms to the requirements of:
- .1 Section 01 25 00 Product Substitutions: In Compliance: \_\_\_\_\_. Not In Compliance: \_\_\_\_\_.
- .2 Section 01 35 63 LEED (Sustainability) Requirements and Procedures: In Compliance: \_\_\_\_\_. Not In Compliance: \_\_\_\_\_.
- .3 Supporting data has been provided with this "Substitution Request Form".
- .4 Product Data: In Compliance: \_\_\_\_\_. Not In Compliance : \_\_\_\_\_. Not Required: \_\_\_\_\_.

## SUBSTITUTION REQUEST FORM

---

.5 Shop Drawings: In Compliance: \_\_\_\_\_. Not In Compliance : \_\_\_\_\_. Not Required: \_\_\_\_\_.

.6 Samples: In Compliance: \_\_\_\_\_. Not In Compliance:

.7 \_\_\_\_\_. Not Required: \_\_\_\_\_.

.8 Other Supporting Data:

\_\_\_\_\_  
\_\_\_\_\_

.2 Recommendation:

.1 Resubmit with additional information: \_\_\_\_\_.

.2 Reviewed equivalent: \_\_\_\_\_.

.3 Reviewed unacceptable: \_\_\_\_\_.

.3 Comments:

\_\_\_\_\_  
\_\_\_\_\_

.1

.1 Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## OWNER'S DIRECTIVE

.1 Owner's Directive: The undersigned acknowledges the following.

.1 Provide proposed substitution: \_\_\_\_\_.

.2 Substituted product not acceptable: \_\_\_\_\_.

.3

.1 Signature: \_\_\_\_\_ Date: \_\_\_\_\_

END OF SECTION



**LETTER OF CONFORMANCE FORM**

---

**PROJECT:**

---

**CONTRACTOR:** \_\_\_\_\_

The following product(s) has been selected for use in the above referenced project from the list of specified items.

Section Number: \_\_\_\_\_ Section Name: \_\_\_\_\_

Drawing Number(s): \_\_\_\_\_ Detail Number(s): \_\_\_\_\_

**SPECIFIED ITEM TO BE USED:**

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**STATEMENT OF CONFORMANCE:**

This Letter of Conformance is provided as a Submittal for Information in accordance with Section 01 33 00 Submittal Procedures. The undersigned hereby declares that the Product identified above by manufacturer's name and model number is (one of) the product(s) specified and is suitable for the intended use as defined within the Contract Documents and has been provided and placed in operational condition in accordance with the manufacturer's published instructions and the Contract Documents.

**SUBCONTRACTOR/SUPPLIER:**

\_\_\_\_\_ Phone Number: \_\_\_\_\_

(Contact name of subcontractor/supplier offering above product)

---

---

(Subcontractor/supplier name and address)

**CONTRACTOR:**

---

(Contact name of Contractor)

(Contractor signature and Title of Signatory)

**END OF SECTION**

1

## SUMMARY OF WORK

---

### Part 1 General

#### 1.1 RELATED DOCUMENTS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SECTION INCLUDES

- .1 Documents and terminology.
- .2 Associated requirements.
- .3 Work expectations.
- .4 Work by Owner.
- .5 Premises usage.

#### 1.3 RELATED SECTIONS

- .1 Section 01 19 00 Specifications and Documents.
- .2 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### 1.4 DESCRIPTION OF THE WORK

- .1 Work of this Contract comprises general construction and interior finishing for a addition to the Existing Visitors Center Building. The project takes place on the grounds of Hilton Fall Conservation Area, located at 4985 Campbellville Rd, Milton, ON L7P 0G3. The project consists of three phases which have been identified on the documents and drawings. The contractor is to provide pricing for all three phases. The tender shall identify the costs of each phase independently to allow the client to determine the extent of the project that will be completed this year.

**Phase one** consists of an interior alteration of existing washrooms and addition to the existing building for a new barrier free washroom. A large new deck with a new roof extension is also part of phase one.

**Phase two** consists of a new addition to the existing building to house new offices. All work associated with completing the addition will form part of phase two.

**Phase three** consists of a new barrier free landscape ramp. The phase pertains to the construction of the ramp along with the preservation of existing trees. The contractor will work closely with Conservation Halton on this phase to ensure and minimize tree damage.

## **SUMMARY OF WORK**

---

- .1 Attend a preconstruction meeting with the Conservation Halton to review scope and verify:
  - .1 Exact building dimensions and site location.
  - .2 Finished floor elevations.
  - .3 Verify all current supplied site services meet the requirements of the lease agreement.
  - .4 This must be included in your base bid.
- .2 Contractor shall coordinate with Conservation Halton's tender documents for division of work.
- .3 LEED Certification Requirement: None

### **1.5 CONTRACT METHOD**

- .1 Construct work under contract as per Conservation Halton's tender documents.
- .2 Contract Documents were prepared by the Consultants on behalf of the Owner. Any use by which a third party makes of the Contract Documents, or any reliance on or decisions to be made based on them, are the responsibility of such third parties. The Consultant and Owner accept no responsibility for damages, suffered by any third party as a result of decisions made or actions based on the Contract Documents.
- .3 For purposes of reference in these Contract Documents, the term "Contractor" shall mean the party in contract with the Owner.

### **1.6 DOCUMENTS PROVIDED**

- .1 Owner will supply the Contractor with the required sets of Contract Documents for construction purposes.
- .2 The Contractor may obtain additional sets of Contract Documents at the cost of printing, handling and shipping.
- .3 An electronic set of documents will be provided near the end of the Project for purposes of transferring changed information recorded on as-built documents to the electronic Record Documents.

### **1.7 WORK SEQUENCE**

## **SUMMARY OF WORK**

---

- .1 Construct Work to accommodate Owner's usage requirements during the construction period, coordinate construction schedule and operations with Owner.
- .2 Coordinate Progress Schedule with Owner's usage during construction.
- .3 Maintain fire access and control of fire protection equipment, and in accordance with authorities having jurisdiction.

### **1.8 WORK BY OWNER**

- .1 The Owner has awarded contracts or will execute using own forces, for supply and installation of the following work, during the execution of the Work.
  - .1 Signage
  - .2 Graphics
  - .3 Security
- .2 Contractor Responsibilities:
  - .1 Provide support systems to receive Owner's work, as well as plumbing, HVAC, and electrical connections.
  - .2 Be present for delivery and assist the Owner's inspection.
  - .3 Review submittals for coordination and compatibility with Work. Notify Consultant of discrepancies or anticipated problems regarding incorporation of the Owner's work.
  - .4 Make provisions for receiving, unloading, handling, storing Owner furnished items at Project Site.

### **1.9 OWNER-SUPPLIED PRODUCTS**

- .1 General: Owner will supply pre-purchase materials and equipment to be incorporated into and during the Work. Include costs for receiving, handling, storage if required, and installation of material and equipment in the Contract Sum, unless otherwise indicated.
- .2 Owner Supplied Products to include: None

## **SUMMARY OF WORK**

---

### **1.10 CONTRACTOR USE OF PREMISES**

- .1 Limit use of site and premises to allow:
  - .1 Owner and public occupancy.
- .2 Emergency Building Exits During Construction: Unless otherwise indicated, as directed by Owner.
- .3 Construction Operations: Limited to areas as indicated.
  - .1 Operations occurring within existing building shall be scheduled to Owner's approval.

**END OF SECTION**

## **SPECIFICATIONS AND DOCUMENTS**

---

### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Complementary documents.
- .2 Conflicts and omissions in drawings and Specifications.
- .3 Precedence of documents
- .4 Specification grammar.
- .5 Specification language.
- .6 Words and terms.
- .7 Objections to specified products

#### **1.3 RELATED SECTIONS**

- .1 01 25 00 Product Substitutions.
- .2 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 COMPLEMENTARY DOCUMENTS**

- .1 Generally, drawings indicate graphically, the dimensions and location of components and equipment. Specifications indicate specific components, assemblies, and identify quality.
- .2 Drawings, Specifications, diagrams and schedules are complementary, each to the other, and what is required by one, to be binding as if required by all.
- .3 Should any conflict or discrepancy appear between documents, which leave doubt as to the intent or meaning, apply the Precedence of Documents as specified.
- .4 Examine all discipline drawings, Specifications, schedules, diagrams and related work to ensure that Work can be satisfactorily executed.

## **SPECIFICATIONS AND DOCUMENTS**

---

### **1.5 CONFLICTS AND OMISSIONS IN DRAWINGS AND SPECIFICATIONS**

- .1 Bring immediately to Consultant's attention for interpretation and direction, conflicts and omissions in Drawings and Specifications.

### **1.6 PRECEDENCE OF DOCUMENTS**

- .1 In the event of conflict within and between the Contract Documents, the order of priority within Specifications and Drawings are, from highest to lowest, unless otherwise specified in the Agreement or General Conditions of the Contract:
  - .1 Agreement - Between Owner and Contractor;
  - .2 Supplementary Conditions;
  - .3 General Conditions of the Contract;
  - .4 Sections of Division 01 of the Specifications;
  - .5 Specifications:
    - .1 Sections of Divisions 02 through 49 of the Specifications, and;
    - .2 Specifications specifically indicated on Drawings.
  - .6 Schedules and Keynotes:
    - .1 Schedules within the Specifications, then;
    - .2 Schedules and keynotes on Drawings.
  - .7 Drawings:
    - .1 Drawings of larger scale shall govern over those of smaller scale of the same date, then;
    - .2 Dimensions shown on Drawings shall govern, then;
    - .3 Location of utility outlets indicated on architectural detail drawings takes precedence over positions or mounting heights located on mechanical or electrical drawings.
    - .4 Later dated documents shall govern over earlier documents of the same type.
- .2 In the event of conflict between documents, the decision of the Consultant shall be final.

### **1.7 SPECIFICATION GRAMMAR**

- .1 Specifications are written in the imperative (command) mode, in an abbreviated form.
- .2 Imperative language of the technical sections is always directed to the Contractor identified as a primary constructor, as sole executor of the Contract, unless specifically noted otherwise.
  - .1 This form of imperative (command) mode statement requires the primary constructor to perform such action or Work.
  - .2 Perform all requirements of the Contract Documents whether stated imperatively or otherwise.
  - .3 Division of the Work among subcontractors, suppliers, or others is solely the Contractor's responsibility. The Consultants and Specification authors assume no



## **SPECIFICATIONS AND DOCUMENTS**

---

responsibility to function or act as an arbiter to establish subcontract scope or limits between sections or divisions of Work.

### **1.8 SPECIFICATION LANGUAGE**

- .1 The Specifications are a special form of technical writing and contain deviations from traditional writing formats. Capitalization and bold print is used to assist the reader in finding information and no other meaning is implied.
- .2 Except where specifically indicated otherwise, the subject of imperative statements is the Contractor.
- .3 Streamlined language is generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Owner or by others when so noted.

### **1.9 WORDS AND TERMS**

- .1 Conform to definitions and their defined meanings in the Agreement, General Conditions and Supplementary Conditions of the Contract, supplemented as follows:
  - .1 The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - .2 "Provide": Means furnish and install, compete with necessary components and accessories, ready for intended use.
  - .3 "Indicated": Is a reference to other portions of the Contract Documents.
  - .4 "Approved": Except where specifically stated otherwise, the words "approved", "directed", "requested", "selected", "accepted", mean "approved by the Owner or Consultant", "directed by the Owner or Consultant" and so on. The words "approved" and "accepted" shall be held to the limitations stated in the General and Supplementary Conditions. In no case shall "approval" or "acceptance" by the Owner be interpreted as a release of Contractor of their responsibilities to fulfill all of the requirements of the Contract Documents.
  - .5 "Furnish": Except as otherwise defined in greater detail, furnish means supply, including shop fabrication if applicable, and delivery to project site, ready for unloading, unpacking, assembly, installation and similar operations as applicable in each instance.
  - .6 "Install": Except as otherwise defined in greater detail, install means operations at project site including but not limited to, unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, placing in service and similar operations as applicable in each instance.
  - .7 "Installer": The person or firm engaged by Contractor for performance of a specific unit of installation work at the project site. It is a general requirement that Installers be expert and have 5 years minimum experience in the work they are engaged to perform.
  - .8 "Observe, Observation": Except as otherwise specified, the Consultant's

## **SPECIFICATIONS AND DOCUMENTS**

---

observation of the work will be held to the limitations stated in the General and Supplementary Conditions and the Owner/Consultant Agreement. In no case shall observation by the Owner or Consultant be interpreted as a release of Contractor of their responsibilities to fulfill all of the requirements of the Contract Documents.

### **1.10 OBJECTIONS TO SPECIFIED PRODUCTS**

- .1 Where Contractor has reasonable objection to specified products, or valid reason for proposing substitutions, comply with provisions of Section 01 25 00 Product Substitutions.
- .2 Where not approved by Consultant, substitutions to specified Products constitutes Non-Conforming Work, as defined by General Conditions, and requires removal and replacement with specified or approved Products.

### **Part 2 Products**

- .1 Not Used.

### **Part 3 Execution**

- .1 Not Used.

**END OF SECTION**

## **ELECTRONIC MODEL DATABASE**

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### **Part 1 General**

#### **1.1 RELATED REQUIREMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Review and coordination of electronic databases with associated Contract Documents.

#### **1.3 RELATED SECTIONS**

- .1 Section 011900 Specifications and Documents.
- .2 Section 013300 Submittal Procedures.
- .3 Section 017810 Closeout Submittals.
- .4 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 DEFINITIONS**

- .1 Revit, by Autodesk: Refers to the proprietary computer aided drafting (CAD) software used by the Consultant to generate the 2-dimensional (2D) or 3-dimensional (3D) virtual model, and generate the image drawings, that together represent a portion of the Work of the Contract Documents.
- .2 Model Database: An electronic file containing three-dimensional geometry data, and may contain data about the building elements they represent and their required or actual properties. The model database represents a virtual model of the project.
- .3 Constructor: Refers to Contractor and applicable subcontractors whose Work are represented by aspects and elements included in the Model Database.
- .4 Element: Refers to a portion or component of the Work. Elements relate primarily to overall geometric forms of the facility as represented. Elements are identified consistently in Model Databases.
- .5 Face: Refers to a single plane in three-dimensional space, and whose perimeter shape is defined in the remaining two dimensions.

#### **1.5 SITE WORK**

- .1 The Contract Documents depict the existing building conditions as observed and as indicated on documents provided to the Consultant by the Owner.

## **ELECTRONIC MODEL DATABASE**

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- .1 Before starting the Work, Constructor to verify that existing conditions match those depicted in the Contract Documents.
- .2 Notify the Consultant upon discovery, if discrepancies are present.
- .2 Consultant has established an origin in space for referencing the two dimensional and three dimensional Contract Documents representations.
  - .1 Project grid and associated work points are measured from these origin points.
  - .2 Transmit electronic data to and from Consultant using the “origin to origin” option in Revit.
- .3 Establish elevations, levels, perimeters and control points based on the origin point by utilizing standard engineering survey practices.
- .4 Additional site control points may be established to complement the origin point, at the discretion of the Constructor and field surveyor.
- .5 Protect control points through duration of construction.

### **1.6 REVIEW OF MODEL DATABASE AND CONTRACT DOCUMENTS**

- .1 Before starting the Work, Constructors shall jointly perform thorough reviews of the Contract Documents to assess the quality and accuracy of the prepared documents, the coordination between Contract Documents, and logic of construction sequencing necessary to further detail and construct the Work:
  - .1 After joint reviews by Constructors, perform separate and subsequent joint reviews with the Consultant.
  - .2 Identify known or potential problems in the Contract Documents, such as conflicts or omissions that may impact construction cost or schedule.
  - .3 Report the results of reviews to Consultant in writing, prior to proceeding with the Work. The Consultant will review the report and respond in writing to the Constructor, issuing an approval to proceed.
  - .4 Follow-up review meetings are necessary between Constructors, Owner and Consultant to resolve design issues.
  - .5 Failure to perform this document review process indicates acceptance of the quality, accuracy and completeness of the Contract Documents.
- .2 Contract Documents have been created using modelling software for the Model Database and the two-dimensional drawings respectively.

## **ELECTRONIC MODEL DATABASE**

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- .1 Perform reviews and ongoing construction administration to ensure that building information is conveyed and implemented accurately.
- .2 Consultant cannot guarantee that translation of Contract Document files into other software formats will be error free. Should translation of files be required, only current version acceptable CAD file format will be provided.
- .3 All such translation is the responsibility of the Constructor unless agreed otherwise.

### **1.7 OWNERSHIP AND USE**

- .1 Ownership of Data: Model database, two dimensional drawing files, electronic media, electronic forms and associated stored representations are subject to terms and conditions for use of the Consultant's documentary representation of the Work.
- .2 Constructors recognize that information stored on electronic media, such as computer CD or DVD disc, may be subject to uncontrollable deterioration or loss. Constructors agree that the Consultant shall not be liable for the completeness or accuracy of any information provided on electronic media.
  - .1 Model Database and other Contract Documents complement each other.
  - .2 Hard copy documents together with electronic data files will form the basis of the Work.
  - .3 In the event of a conflict, hardcopy documents take precedence over Model Database.
- .3 The Consultant-prepared Model Database will be selectively distributed as part of the Contract Documents after contract award. Refer to Drawings for description of file naming and organization of data.
- .4 The use of the Model Database by Constructors is limited to the following:
  - .1 Establishing project reference origin point of (0,0,0) at the Project site.
  - .2 Establishing scope of project elements represented.
  - .3 Defining geometric parameters of elements represented.
  - .4 Coordinating the two dimensional drawings with the elements represented.
  - .5 Referencing the intent of Consultant's design for development and coordination of elements related or adjacent to the work.
- .5 Constructors agree to the following by use of the Model Database:

## **ELECTRONIC MODEL DATABASE**

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- .1 Authorized Use of Model Database: Consultant grants the Constructor the non-exclusive right to use the Model Database for the Project in accordance with these conditions. Use the Model Database for establishing geometries of represented surfaces, objects and elements and their relationship to work points established in associated Contract Documents as part of this Project.
- .2 Constructors, their respective agents or representatives shall not be entitled to rely on the detail or specifications contained in the Model Database for any other purpose.
- .3 Constructors acknowledge:
  - .1 the limited completeness of data in the Model Database,
  - .2 that this data is intended to supplement other Contract Documents, and that the Model Database may require further engineering by the contracted fabricator or other constructor, for fabrication or erection purposes.
  - .3 that the Model Database may be used in future for facility maintenance or future additions.
- .4 Unauthorized Use of Model Database: This database shall not be used by Constructors, or transferred to any other party, for use in other projects, additions to the current project, or any other purpose for which the material is not strictly intended by the Consultant, without Consultant's express written permission. Any unauthorized modification or reuse of the material shall be at the Constructor's sole risk, and Constructors shall cause their subcontractors having access to Model Database media to agree to defend, indemnify and hold the Consultant harmless, from all claims, injuries, damages, losses, expenses, and legal fees arising out of the unauthorized modification or use of these materials.
- .5 Model database prepared by the Consultant is provided solely as an instrument of the Consultant's service and is protected by applicable laws. By delivering the Model database to Constructors, the Consultant shall not expand in any manner, the scope of services for which each was engaged pursuant to its Agreement with the Owner, or in any manner alter the division of responsibilities between the Consultant, Constructors and Owner, as defined in their respective Agreements.
- .6 Constructor's Coordination Requirements: Before using the information contained in the Model Database for the development of Constructor's engineering and shop drawings, the Constructor shall:
  - .1 Review and verify conditions, dimensions and data in Model Database prior to the development of shop fabrication drawings, layout drawings, numerically controlled fabrication equipment, or other applications which define, control or regulate the fabrication and erection of project components. Further explanation of elements in the Model Database files are included on 2D drawings.

## **ELECTRONIC MODEL DATABASE**

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- .2 Take all reasonable measures to prevent unauthorized access or copy or loss of this Model Database.
- .3 Maintain independent records of modifications to Model Database which may be processed by Constructor or their employees and agents.
- .4 Cause subcontractors to be solely and exclusively responsible for the accuracy and adequacy of all subsequent Model Database data, computer models or other electronic media developed by such subcontractors.
- .5 Take appropriate action by way of instruction, with subcontractors, employees and agents who have access to Model Database, to ensure compliance with these conditions.
- .6 Others whose work is represented or closely associated with the coordination of exterior enclosure work, will require that copies of Constructors generated model data, computer models or other electronic media be made to the Consultant for review, prior to beginning fabrication operations. Information required is in addition to and submitted with required shop drawing submittals.
- .7 By using the Model Database, Constructors also agree to the following conditions:
  - .1 Verify locations of critical elements during and after installation and record items that vary from the Model Database. Refer to requirements of Section 01 78 10 Closeout Submittals.
  - .2 Import data for control points, surfaces and lines of fabricated and installed Work into Model Database.
- .8 Information stored in the Model Database can conceivably be modified by other parties, intentionally or otherwise, without notice or indication. Consultant reserves the right to remove all indication of its ownership or involvement in the Model Database from each electronic medium not held in its possession. The Consultant does not convey, nor do Constructors obtain any right, title, or interest in the Model Database developed by the Consultant.

### **Part 2 PRODUCTS**

- .1 Not Used.

### **Part 3 EXECUTION**

- .1 Not Used.

**END OF SECTION**

## PRODUCT SUBSTITUTIONS

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### Part 1 General

#### 1.1 RELATED REQUIREMENTS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SECTION INCLUDES

- .1 Requests for Substitution (RFS) prior to execution of contract.
- .2 Requests for Substitution (RFS) after execution of contract.

#### 1.3 RELATED SECTIONS

- .1 Section 006325 Substitution Request Form.
- .2 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### 1.4 DEFINITIONS

- .1 Products Not Available: When all listed manufacturers products in the specification section are no longer manufactured.
- .2 Proprietary specification means a specification which includes one or more proprietary names of products or manufacturers, or both, and may also include descriptive, reference standard, or performance requirements, or any combination thereof.
- .3 Non-proprietary specification means a specification which includes descriptive, reference standard or performance requirements, or any combination thereof, but does not include proprietary names of products or manufacturers.
- .4 Substitution means a product or manufacturer not specified by proprietary name, which may be acceptable in place of a product or manufacturer which, is specified by proprietary name.

#### 1.5 CONTRACTOR PROCEDURES

- .1 Product Options:
  - .1 For products specified by non-proprietary specification:
    - .1 Select any product by any manufacturer, which meets requirements of Contract Documents
  - .2 For products specified by proprietary specification:



## **PRODUCT SUBSTITUTIONS**

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- .1 Select any product or manufacturer named or, substitute an unnamed product or manufacturer in accordance with Substitutions – Products and, Substitutions – Manufacturers article of Part 1 of this Section.
- .3 For products specified by proprietary specification and accompanied by words indicating that substitutions will not be accepted:
  - .1 Select any product or manufacturer named; substitutions are not permitted.
- .2 Substitution Requests Prior to Execution of Contract: Unless otherwise specified, submit substitutions to Consultant no later than 10 calendar days prior to bid opening.
- .3 Substitution requests accompanying Submittals are not permitted. Complete Submittals according to Section 013300 Submittal Procedures.

### **1.6 SUBSTITUTIONS - PRODUCTS**

- .1 Substitute Products: Where substitute products are permitted, unnamed products may be accepted by the Consultant, providing:
  - .1 The proposed substitute products are the same type as, are capable of performing the same functions as, and meet or exceed the standards of quality and performance of the specified products.
  - .2 The proposed substitutions do not require revisions to the Contract Documents nor to the work of Other Contractors.

### **1.7 SUBSTITUTIONS - MANUFACTURERS**

- .1 Substitute Manufacturers: Where substitute manufacturers are permitted, unnamed manufacturers will be accepted by the Consultant, subject to the following:
  - .1 Substitute manufacturers shall have capabilities comparable to those of the named manufacturers. Substitutions shall not require revisions to Contract Documents nor to work of Other Contractors.
  - .2 In making a substitution Contractor represents that they:
    - .1 Have investigated substitute product or manufacturer, or both, and determined it meets or exceeds the criteria of the specified product, including compliance with LEED requirements, and;
    - .2 Will provide the same warranty, or better, for the Substitution as for the specified product.
    - .3 Will make any changes to the Work necessitated by substitution as required for Work to be complete in all respects, and;

## **PRODUCT SUBSTITUTIONS**

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- .4 Waive claims for additional costs and time caused by substitution which may subsequently become apparent.
- .5 Will reimburse Owner and Consultant for review or redesign services associated with re-approval by authorities.
- .6 Will compensate the Owner and Consultant for additional responsibilities beyond those under contract, and which may include redesign, evaluation, administration, increased cost of other construction, and similar considerations.
- .7 Have received necessary approvals of authorities having jurisdiction.
- .8 Have determined that the substitution will not adversely affect the Construction Schedule.
- .3 Do not order or install requested Substitutions without Consultant's acceptance.
- .4 If, in Consultant's opinion, a substitution does not meet requirements of Contract Documents, Contractor shall, at no extra cost to Consultant, provide a product which, in Consultant's opinion, does meet requirements of Contract Documents.

### **1.8 PROPRIETARY SPECIFICATIONS**

- .1 Notwithstanding specified proprietary names of either or both products or manufacturers, products provided shall meet other applicable requirements of Contract Documents. Modify products if necessary to ensure compliance with all requirements of Contract Documents.

### **1.9 CHANGES TO ACCEPTED PRODUCTS AND MANUFACTURERS**

- .1 Products and manufacturers accepted by Consultant for use in performance of Work of Contract shall not be changed without Consultant's written consent.
- .2 Submit requests to change accepted products and manufacturers to Consultant in writing using Substitution Request Form and including the required submittals. Incomplete forms will be rejected.

### **1.10 CONSULTANT PROCEDURE**

- .1 In reviewing the supporting data submitted for substitutions, Consultant will use, for purposes of comparison, all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Specifications.

## **PRODUCT SUBSTITUTIONS**

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- .2 Consultant will review supporting data and will determine that the substitution in the Consultant's opinion is or is not able to meet or exceed the standards of quality, appearance and performance to the material specified.
- .3 Consultant to sign and date the RFS.
- .4 Consultant's Review Time: Reviews and subsequent reviews of substitution proposals shall not change Contract Time.

### **1.11 OWNER PROCEDURE**

- .1 Owner will review Request for Substitution (RFS) form and accept or reject substitution.
- .2 Owner to sign and date RFS.
- .3 Such acceptance from the Owner shall not relieve Contractor from complying with the requirements of the Drawings and Specifications.
- .4 Contractor shall be responsible for costs of changes resulting from Contractor's proposed substitutions which affect other parts of the Work.

### **Part 2 Products**

- .1 Not Used.

### **Part 3 Execution**

- .1 Not Used.

**END OF SECTION**

## **CONTRACT MODIFICATION PROCEDURES**

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### **Part 1 General**

#### **1.1 RELATED REQUIREMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Administrative and procedural requirements for handling and processing Contract modifications.

#### **1.3 RELATED SECTIONS**

- .1 Section 012500 Substitution Procedures, for administrative procedures for handling requests for substitutions made after the Contract award.
- .2 Section 013100 Section Project Managing and Coordination, for Requests for Information, for administrative procedures for handling RFIs.
- .3 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 MINOR CHANGES IN THE WORK**

- .1 Consultant will issue Supplemental Instructions authorizing minor changes in the Work, not involving adjustment to the Contract Price or the Contract Time, on a form generated by the Consultant.

#### **1.5 PROPOSED CHANGE REQUESTS**

- .1 Owner-Initiated Proposal Requests: Consultant will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Price or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - .1 Submit information requested on Proposed Change Notice (also known as Contemplated Change Order) form provided by Consultant.
  - .2 Proposal requests issued by Consultant are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - .3 Within ten working days, unless otherwise specified in the proposal request, after receipt of proposal request, submit a quotation estimating adjustments to the Contract Price and the Contract Time necessary to execute the change.

## **CONTRACT MODIFICATION PROCEDURES**

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- .1 Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - .2 Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - .3 Include separate costs of labor, material and supervision directly attributable to the change.
  - .4 Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  - .5 Include revisions to LEED requirements including recycled or renewable material cost changes, VOC issues, and similar items.
- .2 Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to the Consultant.
- .1 Submit request for the change on Contractor's Proposed Change Notice form.
  - .2 Include a statement outlining reasons for the change and the effect of the change on the Work, including. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum, the Contract Time, and the LEED requirements.
  - .3 Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - .4 Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - .5 Include separate costs of labor, materials, and supervision directly attributable to the change.
  - .6 Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float time before requesting an extension of the Contract Time.
  - .7 Conform to the requirements in Section 01 25 00 Substitution Procedures if the proposed change requires substitution of one product or system for product or system specified.

## **CONTRACT MODIFICATION PROCEDURES**

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- .8 Include revisions to LEED requirements including recycled/renewable material cost changes, VOC issues, and similar items.

### **1.6 CHANGE ORDER PROCEDURES**

- .1 On Owner's approval of a Proposed Change Notice, Consultant will issue a Change Order for signatures of Owner and Contractor.

### **1.7 CHANGE DIRECTIVE**

- .1 Change Directive: Consultant may issue a Change Directive instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  - .1 Construction Change Directive contains a complete description of change in the Work as known to the Consultant. It also designates method to be followed to determine change in the Contract Price or the Contract Time. When unforeseen conditions, work, costs or time not included in the Change Directive, occur, refer to Consultant's separate written directions before proceeding.
- .2 Documentation: Maintain detailed records on a time and material basis of work required by the Change Directive.
  - .1 After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

### **Part 2 Products**

- .1 Not Used.

### **Part 3 Execution**

- .1 Not Used.

**END OF SECTION**

## **PAYMENT PROCEDURES**

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### **Part 1 General**

#### **1.1 RELATED REQUIREMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Schedule of values.
- .2 Progress payments.
- .3 Substantial performance procedures.
- .4 Release of hold-back procedures.
- .5 Final Payment.

#### **1.3 RELATED SECTIONS**

- .1 General Conditions of the Contract.
- .2 Section 01 25 00 Substitution Procedures.
- .3 Section 01 78 10 Closeout Procedures.

#### **1.4 SCHEDULE OF VALUES**

- .1 Submit a printed schedule of values in form acceptable to Consultant, using either of the following:
  - .1 Paper form to permit an authorized signature.
  - .2 Electronic form using an authorized electronic signature.
- .2 Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the primary associated specification section. Also identify site mobilization, bonds and insurance.
- .3 Include in each line item, the amount of specified Allowances. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- .4 Include separately from within each line item, a direct proportional amount of Contractor's overhead and profit.
- .5 Revise schedule to list approved Change Orders, with each Application For Payment.

## **PAYMENT PROCEDURES**

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### **1.5 PROGRESS PAYMENTS**

- .1 Refer to the General Conditions of the Contract.
- .2 Submit a completed application for payment on form provided by Consultant. Include a schedule of progress payments in the form acceptable to Consultant.
- .3 Accompany applications with applicable completed Statutory Declaration forms CCDC 9A and 9B, and workers' compensation clearance certificates.

### **1.6 PROGRESSIVE RELEASE OF HOLD-BACK**

- .1 Comply with the General Conditions of the Contract.
- .2 Before the release of deficiency holdback monies, submit a statement that all known claims for changes in the Contract Price have been presented.

### **1.7 SUBSTANTIAL PERFORMANCE OF THE WORK**

- .1 Comply with the General Conditions of the Contract.
- .2 Submit a schedule of payments and a completed application on form provided by Consultant
- .3 For items required to be submitted prior to Substantial Performance, conform to requirements specified in Section 01 78 10 Closeout Submittals.
- .4 Accompany applications with applicable Statutory Declaration forms CCDC 9A and CCDC 9B.
- .5 Prepare and submit to Consultant a comprehensive list of items to be completed or corrected. Failure to include an item on the list does not alter responsibility to complete the Contract.
- .6 Request Consultant review to establish Substantial Performance of the Work.

### **1.8 PAYMENT OF HOLD-BACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK**

- .1 Comply with the General Conditions of the Contract.
- .2 Accompany applications with applicable Statutory Declaration form CCDC 9B.

### **1.9 FINAL PAYMENT**

- .1 Comply with the General Conditions of the Contract.
- .2 Submit an application for final payment on form provided by Consultant.



## **PAYMENT PROCEDURES**

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**Part 2      Products**

.1    Not Used.

**Part 3      Execution**

.1    Not Used.

**END OF SECTION**

## **PROJECT MANAGING AND COORDINATION**

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### **Part 1      General**

#### **1.1          RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2          SECTION INCLUDES**

- .1 General coordination procedures.
- .2 Project meetings.
- .3 Construction organization and start-up.
- .4 LEED coordination conference.
- .5 On-site documents.
- .6 Construction progress meetings.
- .7 Coordination drawings (also called Interference Drawings).
- .8 Requests for Information (RFIs) (also called Requests for Interpretation).

#### **1.3          RELATED SECTIONS**

- .1 Section 01 19 10 Electronic Model Data Base.
- .2 Section 01 26 00 Contract Modification Procedures.
- .3 Section 01 32 00 Construction Progress Documentation.
- .4 Section 01 33 00 Submittal Procedures.
- .5 Section 01 43 00 Quality Assurance
- .6 Section 01 45 00 Quality Control.
- .7 Section 01 51 00 Temporary Utilities.
- .8 Section 01 78 10 Closeout Submittals.
- .9 Section 01 78 39 Project Record Documents, for record (as-built) documents procedures.
- .10 Section 01 78 40 Maintenance Requirements.

## **PROJECT MANAGING AND COORDINATION**

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- .11 This Section describes requirements applicable to Sections in Divisions 02 to 49.

### **1.4 COORDINATION**

- .1 Perform coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities, and construction work, with progress of Work of other contractors and Work by Owner.

### **1.5 SUPERVISION AND COOPERATION**

- .1 Provide full time superintendent present on site during the Work. Advise Consultant and Owner, name of replacement when superintendent is required to leave the site.

### **1.6 PROJECT MEETINGS**

- .1 Schedule and administer bi-weekly project meetings throughout progress of Work as determined by Consultant.
- .2 Schedule and administer pre-installation meetings when specified in sections and when required to coordinate related or affected Work.
- .3 Prepare agenda for meetings.
- .4 Distribute written notice of each meeting minimum five days in advance of meeting date to Consultants, Owner and relevant subcontractors.
- .5 Provide physical space and make arrangements for meetings.
- .6 Preside at meetings.
- .7 Agenda to include the following:
  - .1 Review and approval of minutes of previous meeting.
  - .2 Review of Work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems impeding construction schedule.
  - .5 Review of off-site fabrication delivery schedules.
  - .6 Corrective measures and procedures to regain projected schedule.
  - .7 Revisions to construction schedule.
  - .8 Progress schedule during succeeding work period.

## **PROJECT MANAGING AND COORDINATION**

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- .9 Review of submittal schedules.
- .10 Maintenance of quality standards.
- .11 Review proposed changes for effect on construction schedule and on completion date.
- .12 Review site safety and security issues.
- .13 Other business.
- .8 Record minutes. Include significant proceedings and decisions. Identify action-by parties.
- .9 Reproduce and distribute copies of minutes within three days after each meeting and transmit to meeting participants, affected parties not in attendance, Consultant, and Owner.

### **1.7 CONSTRUCTION ORGANIZATION AND START-UP**

- .1 Within fifteen days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Senior representatives of the Owner, Consultant, Contractor, major Subcontractors, field inspectors and supervisors are to be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum five days before meeting.
- .4 Agenda to include the following:
  - .1 Appointment of official representative of participants in Work.
  - .2 Schedule of Work, progress scheduling in accordance with Section 01 32 00 Construction Progress Documentation.
  - .3 Schedule of submission of shop drawings, samples, colour chips in accordance with Section 01 33 00 Submittal Procedures.
  - .4 Status of permits and fees required by the General Conditions of the Contract.
  - .5 Status of requirements of authorities having jurisdiction.
  - .6 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 51 00 Temporary Utilities.
  - .7 Site safety and security clearance letters indicating compliance with the Provincial Health and Safety Act.

## **PROJECT MANAGING AND COORDINATION**

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- .8 Delivery schedule of specified equipment in accordance with Section 01 32 00 Construction Progress Documentation.
  - .9 Review of contract modification and request for information procedures.
  - .10 Proposed changes, change order procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.
  - .11 Owner-furnished Products.
  - .12 Record drawings in accordance with Section 01 78 10 Closeout Submittals.
  - .13 Maintenance material and data in accordance with Section 01 78 40 Maintenance Requirements.
  - .14 Take-over procedures, acceptance, and warranties in accordance with Section 01 78 10 Closeout Submittals.
  - .15 Monthly progress claims, administrative procedures, photographs, and holdbacks.
  - .16 Appointment of inspection and testing agencies or firms in accordance with Section 01 43 00 Quality Assurance, and Section 01 45 00 Quality Control.
  - .17 Insurances and transcripts of policies.
  - .5 During construction, coordinate use of site and facilities for intra-project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.
  - .6 Coordinate field engineering and layout work with Consultant.
- 1.8 LEED COORDINATION CONFERENCE**
- .1 Not required.
- 1.9 ON-SITE DOCUMENTS**
- .1 Construction Documents: Maintain at job site, one copy each of the following for construction purposes; do not use for as-built documents. Provide new and revised documents as modifications are issued.
    - .1 Contract drawings.
    - .2 Specifications.
    - .3 Addenda.

## **PROJECT MANAGING AND COORDINATION**

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- .4 Reviewed shop drawings product data, and samples.
- .5 Change orders and other modifications to the Contract.
- .6 Other modifications to Contract.
- .7 Field test reports and records.
- .8 Copy of approved Work schedule.
- .9 Manufacturers' installation and application instructions.
- .10 Labour conditions and wage schedules.
- .11 Applicable current editions of municipal regulations and by-laws, current building codes, complete with addenda bulletins applicable to the Place of the Work.

### **1.10 RECORD (AS-BUILT) DOCUMENTS DURING CONSTRUCTION**

- .1 Maintain record (as-built) documents during construction as specified in Section 01 78 39 Project Record Documents.

### **1.11 SCHEDULES**

- .1 Submit preliminary construction progress schedule in accordance with Section 01 32 00 Construction Progress Documentation, to Consultant, coordinated with Consultant's project schedule.
- .2 After review, revise and resubmit schedule to comply with revised project schedule.
- .3 During progress of Work revise and resubmit as directed by Consultant.

### **1.12 CONSTRUCTION PROGRESS MEETINGS**

- .1 During course of Work schedule weekly progress meetings.
- .2 Contractor, major subcontractors involved in Work and Consultant and Owner are to be in attendance.
- .3 Distribute written notice of each meeting minimum five days in advance of meeting date to affected parties.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three days after meeting.
- .5 Agenda to include following:
  - .1 Review, approval of minutes of previous meeting.

## **PROJECT MANAGING AND COORDINATION**

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- .2 Review of Work progress since previous meeting.
- .3 Field observations, problems, conflicts.
- .4 Problems which impede construction schedule.
- .5 Review of deliveries.
- .6 Review of off-site fabrication delivery schedules.
- .7 Corrective measures and procedures to regain projected schedule.
- .8 Revision to construction schedule.
- .9 Progress schedule, during succeeding two-week and four week work periods.
- .10 Review submittal schedules: expedite as required.
- .11 Status of LEED documentation.
- .12 Maintenance of quality standards.
- .13 Review proposed changes for effect on construction schedule and on completion date.
- .14 Status of RFIs.
- .15 Review of Record Documents.
- .16 Other business.

## **PROJECT MANAGING AND COORDINATION**

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### **1.13 SUBMITTALS**

- .1 Prepare and issue submittals to Consultant for review.
- .2 Submit requests for payment for review, and for transmittal to Consultant.
- .3 Submit requests for information of Contract Documents, and obtain instructions through Consultant.
- .4 Process substitutions through Consultant.
- .5 Process change orders through Consultant.
- .6 Deliver closeout submittals for review and preliminary inspections, for transmittal to Consultant.

### **1.14 COORDINATION DRAWINGS**

- .1 General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
  - .1 Provide information required by Consultant for preparation of coordination drawings.
  - .2 Review drawings prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of the Work and Contract Documents.
- .2 Coordination Digital Data Files: Prepare coordination digital data files according to requirements in Section 01 33 00 Submittal Procedures.
  - .1 Consultant will furnish one set of digital data files of Drawings for use in preparing coordination digital data files as specified in Section 01 19 10 Electronic Model Database.
- .3 Consultant's Review: Consultant will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. Make changes as directed and resubmit when Consultant determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient.



## PROJECT MANAGING AND COORDINATION

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- .4 Coordination Drawings Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
  - .1 Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
  - .2 Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
  - .3 Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
  - .4 Show location and size of access doors required for access to concealed dampers, valves, and other controls.
  - .5 Indicate required installation sequences.
  - .6 Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Consultant indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- .5 Coordination Drawing Organization: Organize coordination drawings as follows:
  - .1 Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
  - .2 Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
  - .3 Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire-alarm, and electrical equipment.
  - .4 Structural Penetrations: Indicate penetrations and openings required for all disciplines.
  - .5 Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing

## **PROJECT MANAGING AND COORDINATION**

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plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.

**.6 Mechanical and Plumbing Work: Show the following:**

- .1** Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
- .2** Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
- .3** Fire-rated enclosures around ductwork.

**.7 Electrical Work: Show the following:**

- .1** Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
- .2** Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
- .3** Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
- .4** Location of pull boxes and junction boxes, dimensioned from column center lines.

**.8 Fire-Protection System: Show the following:**

- .1** Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

### **1.15 REQUESTS FOR INFORMATION (RFIs)**

- .1 General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI.**
  - .1** Consultant will return RFIs submitted to Consultant by other entities controlled by Contractor with no response.
  - .2** Contractor will coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
  - .3** Consultant will endeavor to provide response to RFI within ten working days of submission. Consultant will inform Contractor in timely manner where responses will require additional time to complete. RFIs received by Consultant after 1:00 p.m. will be considered as received the following working day.

## **PROJECT MANAGING AND COORDINATION**

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- .4 Contractor will reimburse time and material costs for Consultant's services when RFI's do not conform to the requirements specified, or, in the opinion of the Consultant, are unnecessary or frivolous.
- .2 Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
  - .1 Project name.
  - .2 Project number.
  - .3 Date.
  - .4 Name of Contractor.
  - .5 Name of Consultant.
  - .6 RFI number, numbered sequentially.
  - .7 RFI subject.
  - .8 Specification Section number and title and related paragraphs, as appropriate.
  - .9 Where RFI requests Consultant response regarding alternate products or materials, completed Product Substitution form shall accompany the RFI.
  - .10 Drawing number and detail references, as appropriate.
  - .11 Field dimensions and conditions, as appropriate.
  - .12 Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Price, Contractor shall state estimated impact in the RFI.
  - .13 Contractor's signature.
  - .14 Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    - .1 Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- .3 RFI Format: Software-generated form with substantially the same content as specified above, acceptable to Consultant.
  - .1 Attachments: Electronic files in Adobe Acrobat PDF format.

## **PROJECT MANAGING AND COORDINATION**

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- .4 Consultant's Action:
  - .1 The following Contractor-generated RFIs will be returned without action:
    - .1 Requests for approval of submittals.
    - .2 Requests for approval of substitutions.
    - .3 Requests for approval of Contractor's means and methods.
    - .4 Requests for coordination information already indicated in the Contract Documents.
    - .5 Requests for adjustments in the Contract Time or the Contract Sum.
    - .6 Requests for information of Consultant's actions on submittals.
    - .7 Incomplete RFIs or inaccurately prepared RFIs.
  - .2 Consultant's action may include a request for additional information, in which case Consultant's time for response will date from time of receipt of additional information.
  - .3 Consultant's action on RFIs that may result in a change to the Contract Time or the Contract Price may be eligible for Contractor to submit a Proposed Change Notice in accordance with Section 01 26 00 Contract Modification Procedures.
    - .1 If Contractor believes the RFI response warrants change in the Contract Time or the Contract Price, notify Consultant in writing within ten working days of receipt of the RFI response.
- .5 RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at Project Meetings. Include the following:
  - .1 Project name.
  - .2 Name and address of Contractor.
  - .3 Name and address of Consultant.
  - .4 RFI number including RFIs that were returned without action or withdrawn.
  - .5 RFI description.
  - .6 Date the RFI was submitted.
  - .7 Date Consultant's response was received.

## **PROJECT MANAGING AND COORDINATION**

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- .6 On receipt of Consultant's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Consultant within seven working days if Contractor disagrees with response.
- .1 Identification of related Supplemental Instruction, Change Directive, Proposed Change Notice, as applicable.

## **PROJECT MANAGING AND COORDINATION**

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### **1.16 CLOSEOUT PROCEDURES**

- .1 Notify Consultant when Work is considered ready for Substantial Performance.
- .2 Accompany Consultant on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with Consultant's instructions for correction of items of Work listed in executed certificate of Substantial Performance and for access to Owneroccupied areas.
- .4 Notify Consultant of instructions for completion of items of Work determined in Consultant's final inspection.

### **Part 2 Products**

- .1 Not Used.

### **Part 3 Execution**

- .1 Not Used.

**END OF SECTION**

## CONSTRUCTION PROGRESS DOCUMENTATION

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### Part 1 General

#### 1.1 RELATED DOCUMENTS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SECTION INCLUDES

- .1 Schedules, form, content, submission.
- .2 Critical path scheduling.
- .3 Progress photographs and video.
- .4 Submittals schedule.

#### 1.3 RELATED SECTIONS

- .1 Section 01 33 00 Submittal Procedures.
- .2 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### 1.4 SCHEDULES

- .1 Submit schedules as follows:
  - .1 Submittal Schedule for Shop Drawings, Coordination Drawings and Product Data.
  - .2 Submittal Schedule for Samples.
  - .3 Submittal Schedule for timeliness of Owner-furnished Products.
  - .4 Product Delivery Schedule.
  - .5 Cash Allowance Schedule for acquiring Products only or Products and Installation, or Installation only.
  - .6 Shutdown or closure activity.
- .2 Schedule Format
  - .1 Prepare schedule in form of a horizontal Gantt bar chart.
  - .2 Provide a separate bar for each major item of work.
  - .3 Split horizontally for projected and actual performance.
  - .4 Provide horizontal time scale identifying first Working Day of each week.
  - .5 Format for listings: chronological order of start of each item of work.
  - .6 Identification of listings: By specification Section numbers
- .3 Schedule Submission
  - .1 Submit initial format of schedules within 15 working days after award of Contract.
  - .2 Submit schedules in electronic format, forward through e-mail as \*.pdf

## **CONSTRUCTION PROGRESS DOCUMENTATION**

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files.

- .3 Submit one opaque reproduction, plus two copies to be retained by Consultant.
- .4 Consultant will review schedule and return review copy within 10 days after receipt.
- .5 Resubmit finalized schedule within 7 days after return of review copy.
- .6 Submit revised progress schedule with each application for payment.
- .7 Distribute copies of revised schedule to:
  - .1 Job site office.
  - .2 Subcontractors.
  - .3 Other concerned parties.
- .8 Instruct recipients to report to Contractor within 10 days, any problems anticipated by timetable shown in schedule.

### **1.5 CONSTRUCTION PROGRESS SCHEDULING**

- .1 Submit initial schedule in duplicate within fifteen days after date of Owner-Contractor Agreement.
- .2 Revise and resubmit at each site meeting but not less than weekly intervals.
- .3 Submit revised schedules with each Application for Payment, identifying changes since previous version.
- .4 Submit a computer generated horizontal bar (Gantt) chart with separate line for each major portion of Work or operation, identifying first work day of each week.
- .5 Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- .6 Indicate estimated percentage of completion for each item of Work at each submission.
- .7 Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and required by Allowances.
- .8 Include dates for commencement and completion of each major element of construction
- .9 Indicate projected percentage of completion of each item as of first day of month.
- .10 Indicate progress of each activity to date of submission schedule.
- .11 Indicate changes occurring since previous submission of schedule:
  - .1 Major changes in scope.
  - .2 Activities modified since previous submission.



## **CONSTRUCTION PROGRESS DOCUMENTATION**

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- .3 Revised projections of progress and completion.
  - .4 Other identifiable changes.
- .12 Provide a narrative report to define:
  - .1 Problem areas, anticipated delays, and impact on schedule.
  - .2 Corrective action recommended and its effect.
  - .3 Effect of changes on schedules of other prime contractors.
- 1.6 PROGRESS PHOTOGRAPHS**
  - .1 Digital Photography
    - .1 Submit electronic copy of digital photography in \*.jpg format, minimum 4 megapixel resolution.
    - .2 Identification: Name and number of project and date of exposure indicated.
  - .2 Number of viewpoints: four. Locations of viewpoints determined by Consultant.
  - .3 Frequency: Monthly with progress statement and as directed by Consultant.
- 1.7 SUBMITTALS SCHEDULE**
  - .1 Include schedule for submitting shop drawings, product data, and samples.
  - .2 Indicate dates for submitting, review time, resubmission time, and last date for meeting fabrication schedule.
  - .3 Include dates when delivery will be required for Owner-furnished products.
  - .4 Include dates when reviewed submittals will be required from Consultant.
- Part 2 Products**
  - .1 Not Used.
- Part 3 Execution**
  - .1 Not Used.

**END OF SECTION**

## **SUBMITTAL PROCEDURES**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Shop drawings and product data.
- .2 Samples.
- .3 Certificates and transcripts.

#### **1.3 RELATED SECTIONS**

- .1 Section 00 65 13 Letter of Conformance Form.
- .2 Section 01 25 00 Product Substitutions.
- .3 Section 01 31 00 Project Managing and Coordination.
- .4 Section 01 32 00 Construction Progress Documentation for submittals schedule.
- .5 Section 01 35 63 LEED Requirements and Procedures, for LEED submittal procedures.
- .6 Section 01 45 00 Quality Control.
- .7 Section 01 78 10 Closeout Submittals.
- .8 Individual sections requesting submittals.
- .9 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 ADMINISTRATIVE**

- .1 Submit to Consultant submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Submit Product Data before or concurrent with Samples. Submit other submittals following Consultant's review of Product Data.

## **SUBMITTAL PROCEDURES**

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- .3 When colours, textures or finishes of one section are specified or indicated to match work of other sections, submit samples of both sections concurrently.
- .4 Requests for Substitutions or Substitutions submitted with or on Submittals are not permitted; Submittals will be returned not reviewed or rejected. Complete substitutions according to Section 00 12 50 Substitution Procedures.
- .5 Work affected by submittal shall not proceed until review is complete.
- .6 Present shop drawings, product data, samples and mock-ups in units of measurement specified in the individual sections. Where not specified, use Imperial units with supplemental values SI Metric units.
  - .1 Where items or information is not manufactured or produced in Imperial units, hard converted values within the Imperial measurement tolerances are acceptable.
- .7 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents.
- .8 Submittals not stamped, signed, dated, identified as to specific project, and attesting to their being reviewed, or incomplete, will be returned without being examined and shall be considered rejected.
- .9 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .10 Verify that field measurements and affected adjacent Work are coordinated.
- .11 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- .12 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
- .13 Keep one reviewed copy of each submission on site.
- .14 The Consultant will review a maximum two submissions for each submittal. In submitting a submittal the Contractor represents that they will reimburse Consultant's for additional services beyond two reviews.

## **SUBMITTAL PROCEDURES**

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### **1.5 SHOP DRAWINGS AND PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .3 Allow ten working days for Consultant's review of each submission, unless otherwise agreed in writing.
- .4 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .5 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of any revisions other than those requested.
- .6 Accompany submissions with duplicate transmittal letter, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .7 Submissions shall include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.

## **SUBMITTAL PROCEDURES**

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- .2 Layout, showing dimensions, including identified field dimensions, and clearances.
- .3 Setting or erection details.
- .4 Capacities.
- .5 Performance characteristics.
- .6 Standards.
- .7 Operating weight.
- .8 Wiring diagrams.
- .9 Single line and schematic diagrams.
- .10 Relationship to other parts of the Work.
  
- .6 Letter of Conformance.
  
- .7 LEED product data.
  
- .8 After Consultant's review, distribute copies.
  
- .9 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request. Include Letter of Conformance with Shop Drawings when required by individual section.
  - .1 Consultants's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by the Consultant for Contractor's use in preparing Shop Drawings, as specified in Section 01 19 10 Electronic Model Data Base.
  
- .10 Submit electronic copies of product data sheets or brochures for requirements requested in specification sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.
  
- .11 Delete information not applicable to project.
  
- .12 Supplement standard information to provide details applicable to project.
  
- .13 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and re-submission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

### **1.6 SAMPLES**

- .1 Submit for review samples in triplicate, as requested in respective specification Sections. Label samples with origin and intended use.
  
- .2 Deliver samples prepaid to Consultant's business address.

## **SUBMITTAL PROCEDURES**

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- .3 Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .6 Make changes in samples which Consultant may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

### **1.7 COORDINATION DRAWING SUBMITTALS**

- .1 Comply with requirements specified in Section 01 31 00 Project Managing and Coordination.
- .2 Submit Coordination Drawings concurrent with Shop Drawings unless otherwise specified in Submittals Schedule.

### **1.8 MOCK-UPS**

- .1 Erect mock-ups in accordance with Section 01 45 00 Quality Control.

### **1.9 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

### **1.10 LEED SUBMITTALS**

- .1 Comply with requirements specified in Section 01 35 63 LEED (Sustainability) Requirements, Procedures and Specifications.

### **1.11 ENGINEERED-DESIGN SERVICES**

- .1 Performance and Design Criteria: When engineered design services by a design professional are specifically required of the Contractor, by the Contract Documents, submit performance and design criteria for products and systems, as specified, and as follows.

## **SUBMITTAL PROCEDURES**

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- .1 Submit performance and design criteria concurrent with or on shop drawings; submit with product data when shop drawings are not specified.
- .2 Include certificate of professional liability insurance.

### **Part 2 Products**

- .1 Not Used.

### **Part 3 Execution**

- .1 Not Used.

**END OF SECTION**

## **REGULATORY REQUIREMENTS**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Laws, notices, permits and fees.
- .2 Discovery of hazardous materials.

#### **1.3 RELATED SECTIONS**

- .1 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 BUILDING CODES AND REGULATIONS**

- .1 Conform to the applicable building code, and other applicable provincial or local code, regulation or by-law required by authorities having jurisdiction, in force at time of application for building permit.
  - .1 In case of conflict or discrepancy, the more stringent requirements shall apply.

#### **1.5 LAWS, NOTICES, PERMITS AND FEES**

- .1 The laws of the Place of the Work shall govern the Work.
- .2 The Owner shall obtain and pay for the building permit, permanent easements and rights of servitude. The Contractor shall be responsible for permits, licenses or certificates necessary for the performance of the Work which were in force at the date of executing the Agreement.
- .3 Give the required notices and comply with the laws, ordinances, rules, regulations or codes which are or become in force during the performance of the Work and which relate to the Work, to the preservation of the public health and to construction safety.
- .4 If the Contractor knowingly performs or allows work to be performed that is contrary to any laws, ordinances, rules, regulations or codes, the Contractor shall be responsible for and shall correct the violations thereof; and shall bear the costs, expenses and damages attributable to the failure to comply with the provisions of such laws, ordinances, rules, regulations or codes. Determine detailed requirements of authorities having jurisdiction.
- .6 Provide inspection authorities with plans and information required for issue of acceptance certificates. Furnish inspection certificates as evidence that the works installed conforms with the requirements of the authority having jurisdiction.
- .7 Pay construction damage deposits levied by municipality in connection with the issuance of a building permit.



## REGULATORY REQUIREMENTS

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### 1.6 HAZARDOUS MATERIAL DISCOVERY

- .1 Asbestos: If material resembling asbestos is encountered in course of demolition work, immediately stop work and notify Consultant.

### 1.7 SMOKING RESTRICTIONS

- .1 Non-smoking Building (Sustainability requirements - LEED Prerequisite IEQ 2): Smoking is not permitted during execution of the Work inside buildings, nor on the project site. Enforce restrictions. Maintain and post sufficient acceptable signs.

### 1.8 FIRE SAFETY

- .1 Prior to the commencement of each phase of the Work:
  - .1 Review proposed exiting and fire access with local Fire Marshall and Owner and obtain approval.
  - .2 Post individual room fire safety plans to suit phase and construction hoarding.
  - .3 Provide and maintain signage. Clearly identify exit routes around construction areas both within and outside of the facility. Text to be Use minimum 75 mm high Arial font text in capitals, red letters on white background; arrows shall point to nearest exit.
  - .4 Cooperate and participate with facility testing exercise procedures for fire and earthquake.
  - .5 Maintain and post fire access routes at all times.
  - .6 Maintain emergency exit routes from the existing facility.

### Part 2 Products

- .1 Not Used.

### Part 3 Execution

- .1 Not Used.

**END OF SECTION**

## REFERENCES

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### Part 1 General

#### 1.1 RELATED DOCUMENTS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SECTION INCLUDES

- .1 References and standards.
- .2 Standards producing industry organizations and their addresses.

#### 1.3 RELATED SECTIONS

- .1 Section 01 61 00 Product Requirements.
- .2 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### 1.4 REFERENCES

- .1 For Products or quality specified by association, trade, or other references or consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- .2 Conform to reference standard by date of issue current on date for receiving bids, except where a specific date is established or required by code.
- .3 Obtain copies of standards where required by product specification sections.
- .4 Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Consultant shall be altered from the Contract Documents by mention or inference otherwise, in any reference document.

#### 1.5 STANDARDS PRODUCING INDUSTRY ORGANIZATIONS

- .1 The following associations and organizations are cited in specification sections. Acronym, name, address, and Internet URL addresses are as follows.
  - .1 Prominent Canadian Organizations:
    - .1 ACEC - Association of Consulting Engineers of Canada, 130 Albert Street, Suite 616, Ottawa, ON K1P 5G4; <http://www.acec.ca>
    - .2 AWMAC - Architectural Woodwork Manufacturers Association of Canada, 516-4 Street West, High River, AB T1V 1B6; <http://www.awmac.com>
    - .3 Canada Green Building Council, 330 – 55 rue Murray Street, Ottawa, ON K1N 5M3; Tel: 613-241-1184, Fax: 613-241-5750; <http://www.cagbc.org>

## REFERENCES

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- .4 CCA - Canadian Construction Association, 75 Albert St., Suite 400, Ottawa, ON K1P 5E7; <http://www.cca-acc.com>
- .5 CCDC - Canadian Construction Documents Committee, Refer to ACEC, CCA, CSC or RAIC; <http://www.CCDC.org>
- .6 CFFM - Canadian Forces Fire Marshal, 101 Colonel By Drive, Ottawa, ON K1A 0K2; <http://www.dnd.ca/admie/dgcps/CFFMe.htm>
- .7 CGA - Canadian Gas Association, 20 Eglinton Avenue West, Suite 1305, Toronto, ON M4R 1K8; <http://www.cga.ca>
- .8 CGSB - Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier Street, Hull, QC K1A 0S5; <http://w3.pwgsc.gc.ca/cgsb>
- .9 CISC - Canadian Institute of Steel Construction, 201 Consumers Road, Suite 300, Willowdale, ON M2J 4G8; <http://www.cisc-icca.ca>
- .10 CLA - Canadian Lumbermen's Association, 27 Goulburn Avenue, Ottawa, ON K1N 8C7; <http://www.cla-ca.ca>
- .11 CNLA - Canadian Nursery Landscape Association, RR #4, Stn. Main, 7856 Fifth Street, Milton, ON L9T 2X8; <http://www.canadanursery.com>
- .12 CRCA - Canadian Roofing Contractors Association, 155 Queen Street, Suite 1300, Ottawa, ON K1P 6L1; <http://www.roofingcanada.com>
- .13 CSA - Canadian Standards Association International, 178 Rexdale Blvd., Toronto, ON M9W 1R3; <http://www.csa-international.org>
- .14 CSC - Construction Specifications Canada, 120 Carlton Street, Suite 312, Toronto, ON M5A 4K2; <http://www.csc-dcc.ca>
- .15 CSDMA - Canadian Steel Door Manufacturers Association, One Yonge Street, Suite 1801, Toronto, ON M5E 1W7; <http://www.csdma.org>
- .16 CSPI - Corrugated Steel Pipe Institute, 652 Bishop Street N, Unit 2A, Cambridge, ON N3H 4V6; <http://www.cspi.ca>
- .17 CSSBI - Canadian Sheet Steel Building Institute, 652 Bishop St. N., Unit 2A, Cambridge, ON N3H 4V6; <http://www.cssbi.ca>
- .18 CUFCA - Canadian Urethane Foam Contractor's Association, Box 3214, Winnipeg, MB R3C 4E7; <http://www.cufca.ca>
- .19 CWC - Canadian Wood Council, 1400 Blair Place, Suite 210, Ottawa, ON K1J 9B8; <http://www.cwc.ca>
- .20 EC - Environment Canada, Conservation and Protection, Inquiry Centre, 351 St. Joseph Blvd, Hull, QC K1A 0H3; <http://www.ec.gc.ca>
- .21 EFC - Electro Federation of Canada, 5800 Explorer Drive, Suite 200, Mississauga, ON L4W 5K9; <http://www.electrofed.com>
- .22 MPI - The Master Painters Institute, 4090 Graveley Street, Burnaby, BC V5C 3T6; [www.paintinfo.com](http://www.paintinfo.com)
- .23 NABA - National Air Barrier Association, PO Box 2747, Winnipeg, MB R3C 4E7; <http://www.naba.ca>
- .24 NLGA - National Lumber Grades Authority, 406-First Capital Place, 960 Quayside Drive, New Westminster, BC V3M 6G2; <http://www.nlga.org>
- .25 NRC - National Research Council, Building M-58, 1200 Montreal Road, Ottawa, ON K1A 0R6; <http://www.nrc.gc.ca>

## REFERENCES

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- .26 QPL - Qualification Program List, c/o Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier Street, Hull, QC K1A 1G6;  
<http://www.pwgsc.gc.ca/cgsb>
- .27 RAIC - Royal Architectural Institute of Canada, 55 Murray Street, Suite 330, Ottawa, ON K1N 5M3; <http://www.raic.org>
- .28 SCC - Standards Council of Canada, 270 Albert Street, Suite 2000, Ottawa, ON K1P 6N7; <http://www.scc.ca>
- .29 TTMAC - Terrazzo, Tile and Marble Association of Canada, 30 Capston Gate, Unit 5 Concord, ON L4K 3E8; <http://www.ttmac.com>
- .30 ULC - Underwriters' Laboratories of Canada, 7 Crouse Road, Toronto, ON M1R 3A9; <http://www.ulc.ca>
- .2 Commonly Referenced USA Organizations:
  - .1 AA - Aluminum Association, 900 19th Street N.W., Washington, DC 20006;  
<http://www.aluminum.org>
  - .2 AASHTO - American Association of State Highway and Transportation Officials, 444 N Capitol Street N.W., Suite 249, Washington, DC 20001;  
<http://www.aashto.org>
  - .3 AHA - American Hardboard Association, 1210W Northwest Hwy, Palatine, IL 60067; <http://www.hardboard.org>
  - .4 AITC - American Institute of Timber Construction, 7012 S. Revere Parkway, Suite 140, Englewood, CO 80112; <http://www.aitcglulam.org>
  - .5 AMCA - Air Movement and Control Association Inc., 30 West University Drive, Arlington Heights, IL 60004-1893; <http://www.amca.org>
  - .6 ANSI - American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036; <http://www.ansi.org>
  - .7 APA - The Engineered Wood Association, P.O. Box 11700, Tacoma, WA 98411-0700; <http://www.apawood.org>
  - .8 API - American Petroleum Institute, 1220 L St. Northwest, Washington, DC 20005-4070; <http://www.api.org>
  - .9 ARI - Air Conditioning and Refrigeration Institute, 4100 N Fairfax Drive, Suite 200, Arlington, VA 22203; <http://www.ari.org>
  - .10 ASHRAE - American Society of Heating, Refrigeration and Air-Conditioning Engineers, 1791 Tullie Circle NE, Atlanta, GA 30329; <http://www.ashrae.org>
  - .11 ASME - American Society of Mechanical Engineers, ASME Headquarters, Park Avenue, New York, NY 10016-5990; <http://www.asme.org>
  - .12 ASTM International, 100 Barr Harbor Drive West, Conshohocken, PA 19428-2959; <http://www.astm.org>
  - .13 AWCI - Association of the Wall and Ceiling Industries International, 803 West Broad Street, Suite 600, Falls Church, VA 22046; <http://www.awci.org>
  - .14 AWPA - American Wire Producer's Association, 801 N Fairfax Street, Suite 211, Alexandria, VA 22314-1757; <http://www.awpa.org>
  - .15 AWPA - American Wood Preservers' Association, P.O. Box 5690, Granbury TX 76049-0690; <http://www.awpa.com>
  - .16 AWS - American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126; <http://www.amweld.org>

## REFERENCES

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- .17 AWWA - American Water Works Association, 6666 W. Quincy Avenue, Denver, CO 80235; <http://www.awwa.org>
- .18 EIMA - EIFS Industry Manufacturer's Association, 3000 Corporate Center Drive, Suite 270, Morrow, GA 30260; <http://www.eima.com>
- .19 ISAP - International Society for Asphalt Paving, 400 Selby Avenue, Suite 1, St. Paul, MN 55102; <http://www.asphalt.org>
- .20 IEEE - Institute of Electrical and Electronics Engineers, IEE Corporate Office, 3 Park Avenue, 17th Floor, New York, NY 10016-5997; <http://www.ieee.org>
- .21 MSS - Manufacturers Standardization Society of the Valve and Fittings Industry, 127 Park Street, N.E., Vienna, VA 22180-4602; <http://www.mss-hq.com>
- .22 NAAMM - National Association of Architectural Metal Manufacturers, 8 South Michigan Avenue, Suite 1000, Chicago, IL 60603; <http://www.naamm.org>
- .23 NEMA - National Electrical Manufacturers Association, 1300 N 17<sup>th</sup> Street, Suite 1847, Rosslyn, VA 22209; <http://www.nema.org>
- .24 NFPA - National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101Quincy, MA 02269-9101; <http://www.nfpa.org>
- .25 NFSA - National Fire Sprinkler Association, P.O. Box 1000, Patterson, NY 12563; <http://www.nfsa.org>
- .26 NHLA - National Hardwood Lumber Association, 6830 Raleigh-La Grange Road, Memphis, TN 38184-0518; <http://www.natlhardwood.org>
- .27 NSPE - National Society of Professional Engineers, 1420 King Street, Alexandria, VA 22314-2794; <http://www.nspe.org>
- .28 PCI - Prestressed Concrete Institute, 209 W. Jackson Blvd., Suite 500, Chicago, IL 60606-6938; <http://www.pci.org>
- .29 PEI - Porcelain Enamel Institute, PO Box 920220, Norcross, GA 30010; <http://www.porecelainenamel.com>
- .30 SSPC - The Society for Protective Coatings, 40 24th Street, 6th Floor, Pittsburgh, PA 15222-4656; <http://www.sspc.org>
- .31 TPI - Truss Plate Institute, 583 D'Onofrio Drive, Suite 200, Madison, WI 53719; <http://www.tpinst.org>
- .32 UL - Underwriters' Laboratories, 333 Pfingsten Road, Northbrook, IL 60062-2096; <http://www.ul.com>

### Part 2 Products

- .1 Not Used.

### Part 3 Execution

- .1 Not Used.

END OF SECTION

## **QUALITY ASSURANCE**

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### **Part 1 General**

#### **1.1 RELATED REQUIREMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Quality assurance criteria.

#### **1.3 RELATED SECTIONS**

- .1 01 45 00 Quality Control.
- .2 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 QUALITY ASSURANCE**

- .1 Cooperate with testing agency services specified in Section 01 45 00 Quality Control, and as indicated in the Contract Documents.
- .2 Testing Agency: Current member in good standing of their respective professional or industry organization and certified to perform specified services.
- .3 Conform to applicable procedures and standards of the certification sponsoring association.
- .4 Perform services under direction of supervisor qualified under certification requirements of sponsoring association.
- .5 Qualifications:
  - .1 Provide adequate workforce training through meetings and demonstrations.
  - .2 Employ qualified person on site with proven deconstruction experience throughout duration of the Work, for consultation and supervision purposes. Experienced person shall be capable of demonstrating techniques to workers unsure of how to disassemble certain assemblies or equipment.
  - .3 Use qualified trades to disassemble parts of the structure for which they are trained to perform.

### **Part 2 Products**

- .1 Not Used.

## QUALITY ASSURANCE

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### Part 3      Execution

.1    Not Used.

END OF SECTION

## **EXAMINATION AND PREPARATION**

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### **Part 1      General**

#### **1.1          RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2          SECTION INCLUDES**

- .1 Field engineering survey services to measure and stake site.
- .2 Recording of subsurface conditions found.
- .3 Survey services to determine measurement inverts for the Work.

#### **1.3          RELATED SECTIONS**

- .1 Section 01 29 00 Payment Procedures.
- .2 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4          SURVEY REFERENCES**

- .1 Owner's identification of existing survey control points and property limits.

#### **1.5          SUBMITTALS**

- .1 Submit name and address of Surveyor to Consultant.
- .2 On request of Consultant, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform to the Contract Documents.

#### **1.6          QUALIFICATIONS OF SURVEYOR**

- .1 Qualified registered land surveyor, licensed to practice in the Place of the Work, acceptable to Owner.



## **EXAMINATION AND PREPARATION**

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### **1.7 SURVEY REFERENCE POINTS**

- .1 Existing base horizontal and vertical control points are designated on Drawings.
- .2 Locate, confirm and protect control points prior to starting site Work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Consultant.
- .4 Report to Consultant when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

### **1.8 SURVEY REQUIREMENTS**

- .1 Establish two permanent benchmarks on site, referenced to established bench marks by survey control points.
- .2 Record locations with horizontal and vertical data in Project Record Documents.
- .3 Establish lines and levels, locate and lay out, by instrumentation.
- .4 Stake for grading, fill and topsoil placement and landscaping features.
- .5 Stake slopes and berms.
- .6 Establish pipe invert elevations.
- .7 Stake batter boards for foundations.
- .8 Establish foundation column locations and floor elevations.
- .9 Establish lines and levels for mechanical and electrical work.

### **1.9 SUBSURFACE CONDITIONS**

- .1 Promptly notify Consultant in writing if discovered surface or subsurface conditions at Place of Work differ materially from those indicated in Contract Documents.
- .2 Advise the Consultant of a reasonable assumption of probable conditions when

## **EXAMINATION AND PREPARATION**

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determined.

- .3 After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes or Change Orders set out in Section 01 29 00 Payment Procedures.

### **1.10 EXAMINATION**

- .1 Inspect and verify existing conditions, including elements or adjacent Work subject to irregularities, damage, movement, including Work during cutting and patching.
- .2 Inspect conditions affecting performance of the Work. Perform inspections after uncovering, when applicable.
- .3 Beginning of work means acceptance of existing conditions.

### **1.11 PREPARATION**

- .1 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .2 Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

### **1.12 EXISTING SERVICES**

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings.
- .2 Remove abandoned service lines within 6 ft (2 m) of structures. Cap or seal lines at cut-off points as directed by Consultant.

### **1.13 LOCATION OF EQUIPMENT AND FIXTURES**

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

## **EXAMINATION AND PREPARATION**

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- .3 Inform Consultant of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Consultant.

### **1.14 SURVEY RECORD**

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

### **Part 2 Products**

- .1 Not Used.

### **Part 3 Execution**

- .1 Not Used.

**END OF SECTION**

## **EXECUTION REQUIREMENTS**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Submittal requirements associated with connecting to new and existing facilities.
- .2 Execution requirements for the Work.

#### **1.3 RELATED SECTIONS**

- .1 Section 01 70 00 Examination and Preparation.
- .2 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 SUBMITTALS - ATTACHING TO EXISTING WORK**

- .1 Submit written request in advance of cutting or alteration which affects:
  - .1 Structural integrity of any element of Project.
  - .2 Integrity of weather-exposed or moisture-resistant elements.
  - .3 Efficiency, maintenance, or safety of any operational element.
  - .4 Visual qualities of sight-exposed elements.
  - .5 Work of Owner or separate contractor.
- .2 Include in request:
  - .1 Identification of Project.
  - .2 Location and description of affected Work.
  - .3 Statement on necessity for cutting or alteration.
  - .4 Description of proposed Work, and products to be used.
  - .5 Alternatives to cutting and patching.
  - .6 Effect on Work of Owner or separate contractor.
  - .7 Written permission of affected separate contractor.
  - .8 Date and time work will be executed.

#### **1.5 TOLERANCES**

## **EXECUTION REQUIREMENTS**

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- .1 Monitor fabrication and installation tolerance control of Products to produce acceptable Work.
- .2 Do not permit tolerances to accumulate beyond effective or practical limits.
- .3 Comply with manufacturers' tolerances. In case of conflict between manufacturers' tolerances and Contract Documents, request clarification from Consultant before proceeding.
- .4 Adjust Products to appropriate dimensions; position and confirm tolerance acceptability, before permanently securing Products in place.

### **1.6 EXECUTION**

- .1 Execute cutting, fitting, and patching to complete the Work.
- .2 Perform all required excavation and fill to complete the Work.
- .3 Fit several parts together, to integrate with other Work.
- .4 Uncover Work to install ill-timed Work.
- .5 Remove and replace defective or non-conforming Work.
- .6 Remove samples of installed Work for testing, if not designated in the respective Section as remaining as part of the Work.
- .7 Provide openings in non-structural elements of Work for penetrations of mechanical, electrical, and associated Work. Limit opening dimensions to minimal sizes required and performed in a neat and clean fashion.
- .8 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .9 Employ competent qualified workers original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight- exposed surfaces.
- .10 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry or concrete work without prior approval.
- .11 Restore work with new products in accordance with requirements of Contract Documents.
- .12 Fit Work airtight reasonably close to opening size to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

## **EXECUTION REQUIREMENTS**

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- .13 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, for full thickness of the constructed element.
- .14 Re-finish surfaces to match adjacent finishes: For continuous surfaces re-finish to nearest intersection; for an assembly, refinish entire unit.
- .15 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

### **Part 2 Products**

- .1 Not Used.

### **Part 3 Execution**

- .1 Not Used.

**END OF SECTION**

## **CLEANING AND WASTE PROCESSING**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Progressive cleaning.
- .2 Cleaning prior to acceptance.

#### **1.3 RELATED SECTIONS**

- .1 This Section describes requirements applicable to Sections in Divisions 02 to 49.

### **Part 2 Products**

#### **2.1 CLEANING MATERIALS**

- .1 Cleaning Agents and Materials: Low VOC content.
- .2 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

### **Part 3 Execution**

#### **3.1 PROGRESSIVE CLEANING**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.
- .3 Clear snow and ice from area of construction, bank or pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris. Containers: Provide on-site steel framed, hinged lid

## **CLEANING AND WASTE PROCESSING**

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containers for collection of waste materials and debris.

- .2 Provide and use clearly marked, separate bins for recycling.
- .5 Remove waste material and debris from site and deposit in waste container at end of each working day.
- .6 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.
- .7 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .8 Provide adequate ventilation during use of volatile or noxious substances. Use of enclosure ventilation systems is not permitted for this purpose.
- .9 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

### **3.2 CLEANING PRIOR TO ACCEPTANCE**

- .1 Prior to applying for Substantial Performance of the Work, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.



## **CLEANING AND WASTE PROCESSING**

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- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Clean and polish surface finishes, as recommended by manufacturer.
- .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .16 Sweep and wash clean paved areas.
- .17 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
- .18 Clean roof surfaces, down-spouts, and drainage components.
- .19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .20 Remove snow and ice from access to facilities.

### **3.3 FINAL PRODUCT CLEANING**

- .1 Execute final cleaning prior to final project assessment.
- .2 Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- .3 Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- .4 Replace filters of operating equipment.
- .5 Clean site; sweep paved areas, rake clean landscaped surfaces.
- .6 Remove waste and surplus materials, rubbish, and construction facilities from the site.

**END OF SECTION**

## **CONSTRUCTION WASTE MANAGEMENT & DISPOSAL**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Waste management goals and requirements.

#### **1.3 RELATED SECTIONS**

- .1 Section 00 62 23 Construction Waste Management Reporting Form.
- .2 Section 01 74 00 Cleaning and Waste Processing.
- .3 Section 01 74 21 Construction Waste Management Plan.
- .4 Division 03 Section Concrete Forming.
- .5 Division 03 Section Cast-In-Place Concrete.
- .6 Division 06 Sections for carpentry.
- .7 Division 07 Sections for insulation.
- .8 Division 08 Section Glass and Glazing.
- .9 Division 09 Section Gypsum Board Assemblies.
- .10 Division 09 Section Painting.
- .11 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 WASTE MANAGEMENT GOALS**

- .1 Submit and implement a Project Waste Management Plan.
- .2 The Owner has established that this Project shall generate the least amount of waste possible and that processes shall be employed that ensure the generation of as little waste as possible including prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors as well as minimizing

## **CONSTRUCTION WASTE MANAGEMENT & DISPOSAL**

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over packaging and poor quantity estimating.

- .3 Salvage waste materials designated in this specification for reuse and or recycling. Minimize waste disposal in landfills or incinerators. Carefully recycle job site waste.

### **1.5 REGULATORY REQUIREMENTS**

- .1 Conform to applicable codes and regulations for disposal and removal of common and hazardous waste.
- .2 Handle and dispose of hazardous and banned materials in accordance with the regional and municipal regulations.
- .3 Hazardous and banned materials include but are not limited to asbestos, drywall (banned from disposal), underground storage tanks, Polychlorinated Biphenyls (PCBs), abandoned chemicals (gasoline, pesticides, herbicides, flammable and combustible substances), freon from cooling equipment, lead- based paints, smoke detectors, and mercury containing switches.
- .4 Licensed facilities: Use only those brokerage, storage, transfer and disposal facilities which comply with the municipal solid waste and recyclable material regulations.

### **1.6 WASTE MANAGEMENT PLAN**

- .1 Refer to Section 01 74 21 Construction Waste Management Plan.

### **1.7 PAYMENT PROCEDURES**

- .1 Submit with each Application for Progress Payment a summary of waste materials, recycled, salvaged and disposed of by the Project using Section 00 62 23 Construction Waste Management Reporting Form. Failure to submit this information shall render the Application for Payment incomplete and shall delay Progress Payment.

#### **Part 2 Products**

- .1 Not Used.

#### **Part 3 Execution**

- .1 Not Used.

**END OF SECTION**

## **CONSTRUCTION WASTE MANAGEMENT PLAN**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Construction waste management plan.

#### **1.3 RELATED SECTIONS**

- .1 Section 00 62 23 Construction Waste Management Reporting Form.
- .2 Section 01 74 20 Construction Waste Management and Disposal.
- .3 Section 01 78 10 Closeout Submittals.
- .4 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Objective of the Construction Waste Management Plan:
  - .1 Efficiently manage the waste generated by daily construction activities and divert recyclable waste from the landfill disposal to appropriate recycling centres.
  - .2 Provide trade contractors with guidelines for onsite construction waste management.
- .2 Minimum recycled waste for this Project shall include:
  - .1 Cardboard and Paper products.
  - .2 Recyclable Containers, Beverage Containers and Glass.
  - .3 Concrete, brick, concrete block, asphalt debris.
  - .4 Land clearing waste (excluding excavated material).
  - .5 Metals including rebar, aluminum, metal studs, nails, screws, and scrap metal.
  - .6 Wood, palette wood, dimensional wood.
  - .7 Drywall.
  - .8 Paint.
  - .9 Plastic and other recyclable products noted on site.

## **CONSTRUCTION WASTE MANAGEMENT PLAN**

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### **1.5 QUALITY ASSURANCE**

- .1 General: Develop a waste management plan according to:
  - .1 ASTM E 1609.
  - .2 LEED Requirements.
  - .3 Applicable municipal regulations and guide publications.

### **1.6 PAYMENT PROCEDURES**

- .1 Submit with each Application for Progress Payment a summary of waste materials, recycled, salvaged and disposed of by the Project using Section 00 62 23 Construction Waste Management Reporting Form. Failure to submit this information shall render the Application for Payment incomplete and shall delay Progress Payment.

### **1.7 SUBMITTALS FOR INFORMATION**

- .1 LEED Submittals: Submit the following prior to Substantial Performance as required by Section 01 78 10 Closeout Submittals.
  - .1 Waste Reduction Calculations: Calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
  - .2 Waste Diversion: Completed LEED form for Credit MR 2, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

### **1.8 IMPLEMENTATION AND EXECUTION**

- .1 For compliance with the LEED requirements, implement waste management plan as follows:
  - .1 Designate an on-site Recycling Coordinator whose duties will include the following:
    - .1 Instruct subcontractors on application of Waste Management Plan.
    - .2 Maintain recycling and waste bins in an orderly manner and clearly marked to avoid contamination of materials.
    - .3 Inform designated haulers when a specific bin is ready to be removed and ensure the appropriate method of disposal is documented.
  - .2 Designate an area for subcontractors to separate their construction debris into appropriate disposal bins.
  - .3 Hold meetings for subcontractors when Waste Management Plan is not being adhered to.
  - .4 Verify hazardous wastes are being separated, stored and disposed of in accordance

## CONSTRUCTION WASTE MANAGEMENT PLAN

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with local and EPA regulations.

- .2 Supply disposal bins and recycle as required to complete the work.
  - .1 A mixed debris bin may be used for some materials.
  - .2 If used, this bin will be sorted by the same company to separate recyclable materials from mixed bin.
- .3 The relevant details regarding waste management and recycling practices will be incorporated into the subcontract agreements with each subcontractor. Compliance is mandatory.
- .4 Designate Subcontractor LEED Coordinator to be responsible for training their crew to properly sort and dispose of construction debris following Project's Construction Waste Management Plan.

### 1.9 RECORDS AND DOCUMENTATION

- .1 Monthly waste management manifests: Submit monthly waste management manifests and make available to LEED Project Coordinator when requested.
- .2 Keep copies of waste management manifests on site. Include:
  - .1 All dated weigh slips of bins that were hauled.
  - .2 Slips shall contain: waste material types, quantities in metric kilograms and the location where material was recycled or disposed.

### 1.10 ON-SITE MATERIAL WASTE AND RECYCLE

MATERIALS	WASTE REDUCTION	Recycling/Waste DISPOSAL
Site Clearing-Organic Material	REUSE / RECYCLE: Site clearing organic materials are to be re- used on site where possible within landscape areas.	Incorporate organic material in landscape areas where possible. If required to remove from site ensure materials are deposited at a composting recycle facility.
Contaminated Material	REUSE: Contaminated materials encountered on site are to remain on site.	Contaminated soils are to be used as fill on site under the direction of the Environmental Consultant.
Concrete	REUSE / RECYCLE: Optimize use of concrete delivered to site by accurate ordering of quantities, site precast units where possible and reuse of concrete waste.	All unused concrete waste is to be deposited in locations on site to be used as clean fill.

## CONSTRUCTION WASTE MANAGEMENT PLAN

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Masonry	REUSE / RECYCLE: Where possible, optimize use of masonry units by efficient layout, cutting and reuse of masonry waste.	All unused masonry waste is to be deposited in locations on site to be used as clean fill.
All Metals	REUSE / RECYCLE: Optimize use of pipe and framing systems by efficient cutting and use of shorts. Set aside materials to be reused ensuring that they are stored in an orderly and accessible fashion.	Metal off cuts and ends are to be deposited in the appropriate bin for recycling. Pipe cutting and threading waste contaminated with cutting oil is to be removed and recycled by subtrade.
Wood	REUSE / RECYCLE: Reuse forming materials; hoarding, etc. Set aside materials to be re-used, ensuring that they are stored in an orderly and accessible fashion. Wood Pallets are to be returned to suppliers.	Clean untreated and uncoated wood (including broken pallets) and deposit in appropriate bin for recycling. Nails are okay, steel banding is to be removed.
Gypsum Board	REUSE / RECYCLE: Optimize use of Gypsum Board by efficient cutting and use of shorts where possible. Set aside materials to be re-used ensuring that they are stored in an orderly and accessible fashion.	Subtrade is to provide a collection container for recycling and coordinate removal from site. Sub- contractor to submit manifests to Recycling Coordinator.
Plastics	REUSE / RECYCLE: Optimize use of plastic materials on site to reduce waste. Sub-trades are to request that materials be delivered without plastic wrap where possible.	Waste plastics are to be deposited in the appropriate bin for recycling or disposal.
Paint	REUSE / RECYCLE: Salvage excess paint for use by Owner, consolidate containers and ensure that the contents are clearly identified and that lids have air tight seals.	Sub-contractor is to provide collection container for recycling and coordinate removal from site. Sub- contractor to submit manifests to Recycling Coordinator.
Electrical wire Spools	REUSE / RECYCLE: Return spools to suppliers for reuse.	Return to supplier if possible. Remainder to be deposited in appropriate bin for recycling.
Fluorescent Lights and Ballasts	REUSE / RECYCLE: Ensure lamps are stored safely and adequate precautions are taken to avoid unnecessary breakage. Save undamaged lamps for use by	Sub-contractor to provide collection container for recycling and submit manifests to Recycling Coordinator.

## CONSTRUCTION WASTE MANAGEMENT PLAN

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Remaining Materials	All trades are to check with the Recycling Coordinator on the possibility of recycle content of waste before disposal.	Contaminated and non- recyclable materials to be deposited in waste bin.
Beverage Containers	RECYCLE: Deposit in project's appropriate collection container.	Return to a bottle depot for credit.
Cardboard	RECYCLE: Deposit in project's appropriate collection container.	Deliver to local waste paper recovery depot.
Mixed Office Paper	RECYCLE: Deposit in project's appropriate collection container.	Deliver to local waste paper recycling depot.

### 1.11 Hazardous Wastes

- .1 Hazardous wastes are to be separated, labeled, stored and recycled or disposed of in accordance with the requirements of local codes and bylaws, and authorities having jurisdiction, including Provincial Occupational Health & Safety Regulations and WHMIS, under the direction of the Recycling Coordinator.
  - .1 Hazardous and banned materials include but are not limited to asbestos, drywall (banned from disposal), underground storage tanks, Polychlorinated Biphenyls (PCBs), abandoned chemicals (gasoline, pesticides, herbicides, flammable and combustible substances), freon from cooling equipment, lead-based paints, smoke detectors, and mercury containing switches.
- .2 Where possible, hazardous materials like paints, adhesives, and other products shall be reused rather than disposed of or recycled.
- .3 Licensed Facilities: Use only brokerage, storage, transfer and disposal facilities which conform to requirements of applicable codes and local bylaws, and those licensed by other jurisdictions for the recycling and disposal of waste materials.

### Part 2 Products

- .1 Not Used.

### Part 3 Execution

- .1 Not Used.

END OF SECTION



## **STARTUP PROCEDURES**

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### **Part 1      General**

#### **1.1          RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2          SECTION INCLUDES**

- .1 Starting equipment in preparation for adjusting and commissioning.
- .2 Bringing the facility to a fully operational state, free of deficiencies, in the most efficient and timely manner achievable.
- .3 Contractor's and Owner's responsibilities during each of the following successive sub phases of facility start-up:
  - .1 Contractor start-up which leads to Interim Acceptance of the Work.
  - .2 Performance testing which leads to Substantial Completion of the Work.

#### **1.3          RELATED SECTIONS**

- .1 01 33 00 Submittal Procedures.
- .2 01 75 19 Testing, Adjusting and Balancing.
- .3 01 91 00 General Commissioning.
- .4 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4          SUBMISSIONS**

- .1 Advise Commissioning Manager of report forms required for equipment and systems but not yet supplied by the commissioning manager.
- .2 Provide a sample of manufacturer's start-up forms for equipment or systems not included.
- .3 Submit and completed and verified commissioning manual to the Owner with all data entered and sign-offs, prior to Substantial Completion of the Work.

## **STARTUP PROCEDURES**

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### **Part 2 Products**

- .1 Not Used.

### **Part 3 Execution**

#### **3.1 STARTING SYSTEMS**

- .1 Coordinate schedule for start-up of various equipment and systems.
- .2 Notify Consultant seven days prior to start-up of each item.
- .3 Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- .4 Verify tests, metre readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- .5 Verify that wiring and support components for equipment are complete and tested.
- .6 Execute start-up under supervision of applicable manufacturer's representative and/or Contractors' personnel in accordance with manufacturers' written instructions.
- .7 When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- .8 Submit a written report in accordance with Section 01 33 00 that equipment or system has been properly installed and is functioning correctly.

#### **3.2 START-UP REPORT**

- .1 Commissioning manager will provide start up report forms (check sheets) with the exception of controls.
- .2 Contractor to develop, complete and provide the report forms for all control points, software and hardware
- .3 Submit completed report forms to commissioning manager for review within ninety days of award of contract.
- .4 Commissioning manager will assemble completed report forms into a "commissioning

## STARTUP PROCEDURES

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manual" on the following subjects:

- .1 Each mechanical system, except for controls.
- .2 Each electrical system.
- .5 Refer to Owner for a sample of the commissioning report form.
- .6 Include manufacturer's equipment start-up reports and test certificates as an appendix to the commissioning manual.
- .7 The commissioning manual will be kept on site for use by appropriate contractors and the commissioning manager.
  - .1 Maintain this manual current.
  - .2 Maintain a schedule for work of the commissioning manager in conjunction with the commissioning schedule.
- .8 The report forms are divided into three parts:
  - .1 Technical data.
  - .2 Static checks.
  - .3 Operational checks.
- .9 Contractor is to complete each part prior to verification by the commissioning manager.
- .10 Contractor is responsible for completing the report forms as follows and as indicated on the attached sample:
  - .1 Technical Data:
    - .1 Specified: Commissioning Manager.
    - .2 Shop Drawing: Contractor
    - .3 Installed: Contractor
    - .4 Verified: Commissioning Manager
    - .5 Date/Checked By: Contractor to sign when all shop drawing and installed information is completed.
  - .2 Static Checks:
    - .1 Confirmation of Completion: Contractor to confirm all items listed are completed prior to verification by the commissioning manager.
    - .2 Date / Checked By: Contractor to sign when the installation of the equipment and or systems are complete and ready for the commissioning manager to verify.
  - .3 Operational Checks:
    - .1 Operational checks will be performed by the commissioning manager using the balancing report and control's forms.

## **STARTUP PROCEDURES**

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### **3.3 CONTRACTOR START UP**

- .1 Contractor to perform the following during start-up:
  - .1 Start equipment and systems.
  - .2 Test, adjust and balance equipment and systems as specified in Section 01 75 19 Testing, Adjusting and Balancing.
  - .3 Demonstrate equipment and systems.
- .2 Complete and submit start-up reports including:
  - .1 Contractor's system and equipment start up reports.
  - .2 Manufacturers' equipment start up reports.
  - .3 Review Contract Documents and inspect the Work to ensure completeness of the Work and compliance with requirements of Contract Documents.
- .4 Correct Contract deficiencies and defects identified as a result of the foregoing and as may be identified by the Owner.
- .5 Execute and complete approved Change Orders.
- .6 Perform other work and activities required for fulfillment of prerequisites to Interim Acceptance of the Work.
- .7 Commissioning Manager will perform the following during start-up:
  - .1 Perform preliminary interim inspections as necessary.
  - .2 Witness manufacturers' equipment start-up.
  - .3 Verify starting, testing, adjusting and balancing by Contractor.
  - .4 Provide start-up reports for all systems and equipment and review and approve Contractor start-up reports.
  - .5 Cooperate in systems and equipment demonstration and instruction.
  - .6 Initiate Change Orders as required.
  - .7 Verify correction of Contract deficiencies and defects by Contractor.
  - .8 Verify execution of Change Orders performed by Contractor.
  - .9 Perform other activities related to Substantial Completion of the Work as specified in Section 01 91 00 Commissioning.
- .8 The following will be performed to an on-going cycle of:
  - .1 Owner's inspections.
  - .2 Documentation of results.
  - .3 Diagnosis of problems.
  - .4 Correction of Contract Deficiencies and execution of Change Orders as required.

## **STARTUP PROCEDURES**

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- .5 Verification of results.

### **3.4 PERFORMANCE TESTING**

- .1 Performance testing will be performed by the Commissioning Manager and:
  - .1 Completed prior to Substantial Completion,
  - .2 Completed when each system has been balanced and tested and is operating to the satisfactory of the Commissioning Manager.
- .2 Contractor to perform the following during Performance Testing:
  - .1 Correct Contract deficiencies and defects previously outstanding and those identified during performance testing.
  - .2 Execute Change Orders.
- .3 The following will be performed to an on-going cycle of:
  - .1 Performance testing.
  - .2 Documentation of results.
  - .3 Diagnosis of problems.
  - .4 Correction of Contract deficiencies, defects and execution of Change Orders as required.
  - .5 Verification of results.

### **3.5 SEASONAL CONSTRAINTS**

- .1 Notwithstanding requirements in this section, additional separate cycles of Contractor start-up, performance testing and fine tuning may be necessitated at a later time on equipment and systems whose full operation is dependent on seasonal conditions.
- .2 Contractor's responsibilities with respect to later facility start-up activities are specified in this section.

### **3.6 PARTIAL UTILIZATION OF WORK**

- .1 When partial utilization of the Work is required, the applicable requirements specified in this section apply to the parts of the Work to be utilized.

**END OF SECTION**

## TESTING, ADJUSTING AND BALANCING

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### Part 1 General

#### 1.1 SECTION INCLUDES

- .1 Adjusting products and equipment required by all specification sections for this Project.

#### 1.2 RELATED SECTIONS

- .1 Section 017400 - Cleaning and Waste Processing.
- .2 Section 017516 - Start-Up Procedures.
- .3 This section describes requirements applicable to all Sections within Divisions 02-49.

#### 1.3 PURPOSE

- .1 Testing adjusting and balancing of operating systems will be performed in contract by an agency that will be selected by the Owner and consigned to this Contract:
- .2 Prior to start of balancing, the Contractor is to ensure systems are:
  - .1 piped, ducted, wired and wireless services and systems, including components and equipment forming part thereof,
  - .2 manually and mechanically operated, including components and equipment forming any part,
  - .3 testing, adjusting and balancing will not be started until after all static checks have been completed for the system being balanced and signed off on the commissioning report forms,
  - .4 Contractor to ensure systems are operated at designated times, under conditions required for proper testing, adjusting, and balancing,
  - .5 report any deficiencies or defects which may effect the balancing or noted during testing, adjusting and balancing, which cannot be promptly corrected.

### Part 2 PRODUCTS Not used.

### Part 3 EXECUTION

#### 3.1 PREPARATION

- .1 Prepare each system and item of equipment for testing, adjusting and balancing.

## **TESTING, ADJUSTING AND BALANCING**

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- .2 Verify that each system and equipment installation is complete and in functional operation.
- .3 Verify appropriate ambient conditions.

### **3.2 TESTING**

- .1 Tests will be conducted to confirm compliance with requirements of Contract Documents. Take corrective action as necessary.

### **3.3 ADJUSTING**

- .1 Adjust operating Products and equipment to ensure smooth and unhindered operation.
- .2 Provide equipment required to ensure proper, efficient and safe operation of all equipment including belts and sheaves.

### **3.4 BALANCING**

- .1 Cooperate with, and assist the balancing agent to ensure that the various parts of system are in a proper state of equilibrium.

**END OF SECTION**

## **CLOSEOUT SUBMITTALS**

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### **Part 1 General**

#### **1.1 RELATED REQUIREMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Administrative procedures and submittals at Contract closeout for:
  - .1 Inspections and declarations.
  - .2 Operation and maintenance manual administrative requirements closeout submittals.
  - .3 Record Documents.
  - .4 Final survey.
  - .5 Warranties and bonds.

#### **1.3 RELATED SECTIONS**

- .1 Section 01 31 00 Project Managing and Coordination, other closeout requirements.
- .2 Section 01 33 00 Submittal Procedures.
- .3 Section 01 45 00 Quality Control.
- .4 Section 01 70 00 Examination and Preparation.
- .5 Section 01 78 39 Project Record Documents, for Record (As-Built) Documents and samples including recording actual site conditions.
- .6 Section 01 79 00 Demonstration and Training.
- .7 This section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 INSPECTIONS AND DECLARATIONS**

- .1 Contractor's Inspection: Conduct with Subcontractors, an inspection of the Work, identify list of deficiencies and defects, and repair as required to conform to Contract Documents.
  - .1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made. Include list of corrected deficiencies and defects in form and detail acceptable to Consultant.
  - .2 Request Consultant's Inspection.



## **CLOSEOUT SUBMITTALS**

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- .2 Consultant's Inspection: After acceptance of deficiencies and defects list provided during Contractor's Inspection, perform inspection of Work with Consultant to identify defects or deficiencies. Correct defective and deficient Work accordingly.
- .3 Completion: Submit written certificate that the following have been performed:
  - .1 Work has been completed and inspected for compliance with Contract Documents.
  - .2 Defects have been corrected and deficiencies have been completed.
  - .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
  - .4 Certificates required by authorities having jurisdiction have been submitted.
  - .5 Operation of systems have been demonstrated to Owner's personnel.
  - .6 Work is complete and ready for Final Inspection.
- .4 Final Inspection: When items noted above are completed, request final inspection of Work by Consultant. If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request re-inspection.
- .5 Declaration of Substantial Performance: When Consultant considers deficiencies and defects have been corrected, and it appears requirements of Contract have been substantially performed, make an application for Substantial Performance of the Work.
- .6 Commencement of Warranty Periods: The date of Substantial Performance of the Work shall be the date for commencement of the warranty period.
- .7 Commencement of Lien Periods: The date of publication of the certificate of Substantial Performance of the Work shall be the date for commencement of the lien period, unless required otherwise by the lien legislation applicable at the Place of the Work.
- .8 Final Payment: When Owner and Consultant consider final deficiencies and defects have been corrected and it appears requirements of Contract have been completed, make application for final payment.
- .9 Payment of Hold-back: After issuance of certificate of Substantial Performance of the Work, submit an application for payment of hold-back amount.

### **1.5 SUBMITTALS PRIOR TO SUBSTANTIAL PERFORMANCE OF THE WORK**

- .1 The Contractor or Subcontractor may make an application to the Payment Certifier for a Certificate of Substantial Performance when the Work or portions of the Work is ready for use for the purpose intended and when the following items have been provided to the Payment Certifier:

## **CLOSEOUT SUBMITTALS**

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- .1 Reconciliation of all Change Orders.
- .2 Worker' Compensation Board letter stating that the Contractor and Subcontractors are in good standing.
- .3 Manufacturers' guarantees and warranties, manufacturers' or associations maintenance recommendations, maintenance manuals and operating instructions.
- .4 Reserve, maintenance and replacement materials specified in various sections of the specifications are delivered to the Project and handed over to the Owner.
- .5 A list of major items to be completed or corrected, including the time required to perform the work as well as the proposed completion date.
- .6 Letters of Assurance certified by a professional engineer, for compliance with the applicable code, for seismic and structural performance requirements of architectural systems and finishes, mechanical plumbing and electrical equipment and associated installations, and other subtrades requiring field engineering.
- .7 Contractor's signed letter verifying compliance with the requirement for the building's ventilation systems prior to, and during the collection of test samples for IAQ testing, as specified in the IAQ Testing article in Part 3 of Section 01 57 20 Temporary Indoor Air Quality Control.
- .8 Testing, balancing and checking of equipment and systems as specified in various Sections of Division 23 Heating, Ventilating, and Air Conditioning.
- .9 Certifications of each permit issuing authority indicating approval of permitted installations.
- .10 Certification by testing, cleaning or inspection Authorities or Associations as specified in the Contract Documents.
- .11 Certificate from local authority approving the plumbing installation
- .12 Certificate from local and/or provincial authority approving the gas/oil installations, venting installations.
- .13 Certificate for cleaning duct systems, chemical cleaning and treatment of piping systems, corrosion protection of buried gas piping.
- .14 Certificate from authority approving the installation of boilers and pressure vessels.
- .15 Occupancy permit from the local authority.
- .16 LEED Submittals:
  - .1 Final LEED forms for each Credit and Prerequisite required, in accordance with Section 01 35 63 LEED (Sustainability) Requirements, Procedures and Specifications, and as specified in individual Sections. Provide pdf copies signed by Contractor, and Excel files.
  - .2 Waste management submittals required in Section 01 35 63 LEED Requirements, Procedures and Specifications.

### **1.6 CLOSEOUT SUBMITTALS - OPERATING AND MAINTENANCE MANUAL**

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .2 Copy will be returned after final inspection, with Consultant's comments.

## **CLOSEOUT SUBMITTALS**

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- .3 Revise content of documents as required prior to final submittal.
- .4 Two weeks prior to Substantial Performance of the Work, submit to the Consultant, four final copies of operating and maintenance manuals in Canadian English.
- .5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .6 If requested, furnish evidence as to type, source and quality of products provided.
- .7 Defective products will be rejected, regardless of previous inspections. Replace products at Contractor's expense.
- .8 Pay costs of transportation of documentation.

### **1.7 OPERATING AND MAINTENANCE MANUAL**

- .1 Format:
  - .1 Organize data in the form of an instructional manual For each occupancy type.
  - .2 Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required on CD- ROM.
    - .1 Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
    - .2 File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in sequence of Project Manual Table of Contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
  - .3 Principal Directory Identification: Identify directory Operating and Maintenance Manuals – Project Record Documents.
- .2 Contents - Each Volume:
  - .1 Table of Contents: Provide title of project.
    - .1 Date of submission.
    - .2 Names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
    - .3 Schedule of products and systems, indexed to content of volume.

## **CLOSEOUT SUBMITTALS**

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- .2 For each product or system, list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: On each sheet clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 Quality Control.
- .4 Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Certificate of Acceptance: Relevant certificates issued by authorities having jurisdiction,
- .6 Training: Refer to Section 01 79 00 Demonstration and Training.

### **1.8 RECORD DOCUMENTS AT SUBSTANTIAL PERFORMANCE OF THE WORK**

- .1 Submit Project Record Documents as specified in Section 01 78 39 Project Record Documents.

### **1.9 FINAL SURVEY**

- .1 Submit final site survey certificate in accordance with Section 01 71 00 Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.
- .2 Inaccurate or neglectful information shall become a liability of the Contractor.

### **1.10 WARRANTIES AND BONDS**

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
- .4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.
- .5 Verify that documents are in proper form, contain full information, and are notarized.

## **CLOSEOUT SUBMITTALS**

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- .6 Co-execute submittals when required.
- .7 Retain warranties and bonds until time specified for submittals.

### **Part 2 Products**

- .1 Not Used.

### **Part 3 Execution**

- .1 Not Used.

**END OF SECTION**

## PROJECT RECORD DOCUMENTS

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### Part 1 General

#### 1.1 RELATED REQUIREMENTS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SECTION INCLUDES

- .1 Administrative and procedural requirements for:
  - .1 Record (As-Built) Documents during construction.
  - .2 Record Documents at Substantial Performance of the Work.

#### 1.3 RELATED SECTIONS

- .1 Section 01 78 10 Closeout Submittals, for submittal procedures for project record documents, final survey, and warranties and bonds.
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 49.

#### 1.4 RECORD (AS-BUILT) DOCUMENTS DURING CONSTRUCTION

- .1 Maintain at the site for use by Consultant, one record copy of the following with recorded actual site conditions, as specified:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to the Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.
- .2 Store as-built documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label as-built documents and file in accordance with section number listings in List of Contents of the Project Manual. Label each document "AS-BUILT DOCUMENTS" in neat, large, printed letters.
- .4 Maintain as-built documents in clean, dry and legible condition. Do not use as-built documents for construction purposes.

## PROJECT RECORD DOCUMENTS

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- .5 Keep as-built documents and samples available for inspection by Consultant.
- .6 Recording Actual Site Conditions:
  - .1 Record information on set of black line opaque drawings, and within the Project Manual,
  - .2 Annotate with coloured felt tip marking pens, maintaining separate colours for each major system, for recording changed information.
  - .3 Record information concurrently with construction progress. Do not conceal Work of the Project until required information is accurately recorded.
  - .4 Recording of instruction numbers as a substitute method to written or graphic details is not permitted.
  - .5 Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:
    - .1 Measured depths of elements of foundation in relation to finish first floor datum.
    - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
    - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
    - .4 Field changes of dimension and detail.
    - .5 Changes made by supplemental instructions, and contract modifications.
    - .6 Details not on original Contract Drawings.
    - .7 References to related shop drawings and modifications.
  - .6 Specifications: Legibly mark each item to record actual construction, including:
    - .1 Manufacturer, trade name, and model and catalogue number of each product actually installed, particularly optional items and substitute items.
    - .2 Indicate information on concealed products and installations that cannot be readily identified and recorded later.
    - .3 Changes made by addenda, supplemental instructions, and contract modifications.
  - .7 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specification sections.
- .7 Just prior to Substantial Performance of the Work, and when directed by the Consultant, hand over completed as-built documents in form and completeness acceptable to the Consultant, for Owner to produce "RECORD DOCUMENTS". Provide necessary support information, documentation and ongoing communications to Consultant until Record Documents are complete.
  - .1 Inaccurate or neglectful information shall become the liability of the Contractor.

**PROJECT RECORD DOCUMENTS**

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**Part 2      Products**

.1    Not Used.

**Part 3      Execution**

.1    Not Used.

**END OF SECTION**



## **MAINTENANCE REQUIREMENTS**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Equipment and systems.
- .2 Materials and finishes.
- .3 Spare parts.
- .4 Maintenance materials.
- .5 Special tools.
- .6 Storage, handling and protection.

#### **1.3 RELATED SECTIONS**

- .1 Section 01 45 00 Quality Control.
- .2 Section 01 78 10 Closeout Submittals, including format and each volume contents of operation and maintenance manuals.
- .3 Section 01 91 00 General Commissioning, for verification and compilation of data into operation and maintenance manuals.
- .4 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 EQUIPMENT AND SYSTEMS**

- .1 Each Item of Equipment and Each System: Include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- .2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

## **MAINTENANCE REQUIREMENTS**

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- .3 Include installed colour coded wiring diagrams.
- .4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- .5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .6 Provide servicing and lubrication schedule, and list of lubricants required.
- .7 Include manufacturer's printed operation and maintenance instructions.
- .8 Include sequence of operation by controls manufacturer.
- .9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .10 Provide installed control diagrams by controls manufacturer.
- .11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.
- .12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .14 Include test and balancing reports as specified in Section 01 45 00 Quality Control.
- .15 Additional requirements: As specified in individual specification sections.

### **Part 2 Products**

#### **2.1 MATERIALS AND FINISHES**

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

## **MAINTENANCE REQUIREMENTS**

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- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and Weather-exposed Products: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Building Envelope: include copies of drawings of building envelope components, illustrating the interface with similar or dissimilar items to provide an effective air, vapour and thermal barrier between indoor and outdoor environments. Include an outline of requirements for regular inspections and for regular maintenance to ensure that on-going performance of the building envelope will meet the initial building envelope criteria.
- .5 Additional Requirements: as specified in individual specifications sections.

### **2.2 SPARE PARTS**

- .1 Provide spare parts, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .4 Obtain receipt for delivered products and submit prior to final payment.

### **2.3 MAINTENANCE MATERIALS**

- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.
- .4 Obtain receipt for delivered products and submit prior to final payment.

### **2.4 SPECIAL TOOLS**

## **MAINTENANCE REQUIREMENTS**

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- .1 Provide special tools, in quantities specified in individual specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Receive and catalogue items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

### **Part 3 Execution**

#### **3.1 DELIVERY TO SITE**

- .1 Deliver to location as directed; place and store.

#### **3.2 STORAGE, HANDLING AND PROTECTION**

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and to satisfaction of Consultant.

**END OF SECTION**

## **DEMONSTRATION AND TRAINING**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Procedures for demonstration and instruction of Products, equipment and systems to Owner's personnel.
- .2 Seminars and demonstrations.

#### **1.3 RELATED SECTIONS**

- .1 Section 01 35 63 LEED Requirements, Procedures and Specifications.
- .2 Section 01 75 19 Testing, Adjusting, and Balancing.
- .3 Section 01 91 00 General Commissioning.
- .4 Divisions 23 Mechanical: Testing, adjusting, and balancing of equipment and systems.
- .5 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 DESCRIPTION**

- .1 Demonstrate operation and maintenance of equipment and systems to Owner's personnel at time and schedule agreed upon with Owner, but not less than two weeks prior to date of Substantial Performance
- .2 Owner will provide list of personnel to receive instructions, and will coordinate their attendance at agreed times.

#### **1.5 COMPONENT DEMONSTRATION**

- .1 Manufacturer to provide authorized representative to demonstrate operation of equipment and systems.
- .2 Instruct Owner's personnel and provide written report that demonstration and

## **DEMONSTRATION AND TRAINING**

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instructions have been completed.

### **1.6 SUBMITTALS**

- .1 Submit schedule of time and date for demonstration of each item of equipment and each system two weeks prior to designated dates, for Consultant's approval.
- .2 Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.
- .3 Give time and date of each demonstration, with list of persons present.

### **1.7 CONDITIONS FOR DEMONSTRATIONS**

- .1 Equipment has been inspected and put into operation in accordance with each specification section.
- .2 Testing, adjusting, and balancing has been performed in accordance with the following documents, and equipment and systems are fully operational.
  - .1 Section 01 75 19 Testing, Adjusting, and Balancing.
  - .2 Section 01 91 00 General Commissioning.
  - .3 Mechanical sections of Division 23.
- .3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

### **Part 2 Products**

- .1 Not used.

### **Part 3 Execution**

#### **3.1 PREPARATION**

- .1 Verify that suitable conditions for demonstration and instructions are available.
- .2 Verify that designated personnel are present.

## **DEMONSTRATION AND TRAINING**

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- .3 Prepare agendas and outlines.
- .4 Establish seminar organization.
- .5 Explain component design and operational philosophy and strategy using applicable specification section.
- .6 Develop equipment presentations.
- .7 Present system demonstrations.
- .8 Accept and respond to seminar and demonstration questions with appropriate answers.

### **3.2 PREPARATION OF AGENDAS AND OUTLINES**

- .1 Prepare agendas and outlines including the following:
  - .1 Equipment and systems to be included in seminar presentations.
  - .2 Name of companies and representatives presenting at seminars.
  - .3 Outline of each seminar's content.
  - .4 Time and date allocated to each system and item of equipment.
  - .5 Provide separate agenda for each system

### **3.3 SEMINAR ORGANIZATION**

- .1 Coordinate content and presentations for seminars.
- .2 Coordinate individual presentations and ensure representatives scheduled to present at seminars are in attendance.
- .3 Arrange for presentation leaders familiar with the design, operation, maintenance and troubleshooting of the equipment and systems. Where a single person is not familiar with all aspects of the equipment or system, arrange for specialists familiar with each aspect.
- .4 Coordinate proposed dates for seminars with Owner and select mutually agreeable dates.

### **3.4 EXPLANATION OF DESIGN STRATEGY**

- .1 Explain design philosophy of each system. Include following information:
  - .1 An overview of how system is intended to operate.
  - .2 Description of design parameters, constraints and operational requirements.
  - .3 Description of system operation strategies.
  - .4 Information to help in identifying and troubleshooting system problems.

## **DEMONSTRATION AND TRAINING**

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### **3.5 DEMONSTRATION AND INSTRUCTIONS**

- .1 Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at scheduled agreed upon times, at the equipment designated location.
- .2 Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.
- .3 Instruct personnel on control and maintenance of sensory equipment and operational equipment associated with maintaining energy efficiency and longevity of service.
- .4 Review contents of manual in detail to explain all aspects of operation and maintenance.
- .5 Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.

**END OF SECTION**



## **GENERAL COMMISSIONING**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 General Commissioning, testing and documentation requirements.

#### **1.3 RELATED SECTIONS**

- .1 Section 01 75 16 Start-Up Procedures.
- .2 Section 01 75 19 Testing, Adjusting, and Balancing.
- .3 Section 01 78 40 Maintenance Requirements.
- .4 This Section describes requirements applicable to Sections in Divisions 02 to 49.

#### **1.4 DEFINITIONS**

- .1 Products Not Available: When all listed manufacturers products in the specification section are no longer manufactured.
- .2 Commissioning: The process for achieving, verifying, and documenting that the facility and its systems are planned, designed, installed, and tested to ensure that they meet the original project requirements established by the Owner.
- .3 Commissioning Team:
  - .1 Owner's Representative: Representative of the Owner, as defined in the Agreement.
  - .2 Consultant: Consultant, as defined in the Agreement.
  - .3 Commissioning Manager: Party engaged by the Owner to lead commissioning activities, and coordinate other team members.
  - .4 Contractor Representatives: Representatives of the Contractor, including any sub-contractors whose scope of work includes items requiring commissioning.
  - .5 Testing Agency: Specialty agency engaged by the Owner to perform tests on components or systems to verify conformance to Owner's requirements or specified requirements.
- .4 Commissioning Documents:

## **GENERAL COMMISSIONING**

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- .1 Commissioning Plan: A project-specific document which defines the scope and approach to commissioning of this facility.
- .2 Submittal: Contract submittal, as specified in Contract Documents.
- .3 Static check certificate: A document used to verify equipment data actually installed, prior to startup or operation.
- .4 Operating check certificate. A document used to verify equipment operation, including performance statistics.
- .5 Startup Reports: Report prepared by equipment startup personnel, including start-up sequence, and performance statistics. Refer to Section 01 75 16.
- .6 Balancing Report: Report prepared by the balancing agency, indicating initial and final system performance. Refer to Section 01 75 19.
- .7 Maintenance Manual: A document containing detailed descriptions and technical information about start-up, operation and maintenance of equipment. Refer to Section 01 78 40.

### **1.5 METHODOLOGY**

- .1 The Commissioning Manager shall develop a Commissioning Plan, including the management of commissioning meetings, and the management of project-specific commissioning documents.
- .2 Commissioning Plan to include:
  - .1 Assembly of owner's requirements, including design criteria, performance goals, budgets, and schedules.
  - .2 Scheduling and chairing of commissioning meetings between team members.
  - .3 Development of static and operating check certificates for individual equipment.
  - .4 Assembly of commissioning reports, including testing and balancing reports, maintenance manuals, startup reports, and testing reports.
  - .5 Verification of data by testing agency.
- .3 Execute the commissioning plan.

### **1.6 REGULATORY REQUIREMENTS**

- .1 Arrange for regulatory authorities to witness those commissioning start up procedures which are also required by regulatory authorities.
- .2 Obtain certificates of approval and for compliance with regulations from Authorities Having Jurisdiction; include copies of certificates with start-up reports.

## **GENERAL COMMISSIONING**

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### **1.7 CONTRACT COMMISSIONING REQUIREMENTS**

- .1 Witnessing: Allow commissioning team members to witness starting, testing, adjusting, and balancing procedures.
- .2 Allow Commissioning Manager free access to the site.
- .3 Costs: Pay costs associated with starting, testing, adjusting, and relevant instruments and supplies required to perform those duties.
- .4 Employ experienced personnel for equipment startup and commissioning, who are able to interpret results of readings and tests, and report the system status in a clear and concise manner.
- .5 Provide equipment required to perform testing, balancing, and commissioning of systems. Calibrate instruments used in start-up as accurate; provide calibration certificates if requested by the Commissioning Manager.
- .6 Utilize equipment check certificates and other commissioning documents required by the Commissioning Manager.
- .7 Verify that equipment is installed in accordance with Contract Documents, and reviewed shop drawings. Sign and date static check certificates.
- .8 Do not start up equipment unless static check sheets have been completed and submitted.
- .9 Complete in detail, and sign operating check certificates.

### **Part 2 Products**

- .1 Not Used.

### **Part 3 Execution**

#### **3.1 COMMISSION TESTING**

- .1 Allow for work, effort, and associated costs necessary to assist an Owner appointed and remunerated Commissioning Manager, for fulfilment of a commission testing process of the facility and Work.

## **GENERAL COMMISSIONING**

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- .2 Coordinate, cooperate, and harmonize efforts with the Commissioning Manager.
- .3 Commission testing will include a random testing and evaluation process as determined by the Owner and the Commissioning Manager.
- .4 System and device checks to be suitably logged, tabulated, signed, and incorporated into project Operating and Maintenance Manuals:
  - .1 Prior to start of testing, provide two complete sets of up-to-date contract drawings and specifications including addenda to the Commissioning Manager.
  - .2 Provide one copy of each approved contract modifications and supplemental instructions.
  - .3 Coordinate site visits by the Commissioning Manager and the affected parties during warranty periods.
- .5 The commissioning process will not:
  - .1 Preclude the duties and responsibilities described in the Contract Documents nor the requirements and obligations of the Contract,
  - .2 Circumvent any required warranties,
  - .3 Relieve the Contractor from warranty requirements, responsibilities, or obligations.
- .6 Prior to commission testing, perform the following and provide copies to the Commissioning Manager, of component and assembly Contract Document compliance:
  - .1 Static test certificates.
  - .2 Equipment operating certificates.
  - .3 Three copies of valve tag list.
  - .4 Inspection certificates from authorities having jurisdiction.
  - .5 Required copies of shop drawings.
  - .6 Manufacturer's operating and maintenance brochures of all major equipment.
- .7 Ensure each system has been started, adjusted to design criteria, and are functionally operational, ready for independent testing.
- .8 Cooperate with the Commissioning Manager in advance of activating operating systems.
- .9 Correct work where test results illustrate failure to conform to the Contract Documents, at no cost to Owner.

**END OF SECTION**

2

## SELECTIVE DEMOLITION

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### Part 1      General

#### 1.1      SECTION INCLUDES

- .1      Alteration project procedures.
- .2      Removal of designated building equipment and fixtures.
- .3      Removal of designated construction.
- .4      [Disposal of materials.] [Storage of removed materials.]
- .5      Identification of utilities.
- .6      Refer to items as indicated.

#### 1.2      RELATED SECTIONS

- .1      Section 01 10 13 - Summary of Work:
- .3      Section 01 73 00 - Execution Requirements: Project record documents.

#### 1.3      ALTERATION PROJECT PROCEDURES

- .1      Materials: As specified in Product sections; match existing Products and work for patching and extending work.
- .2      Employ [original] [skilled and experienced] installer to perform alteration work.
- .3      Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- .4      Remove, cut, and patch Work in a manner to minimize damage and to provide means of restoring Products and finishes to [original] [or] [specified] condition.
- .5      Refinish existing visible surfaces to remain in renovated rooms and spaces, to [specified] [renewed] condition for each material, with a neat transition to adjacent finishes.
- .6      Where new Work abuts or aligns with existing, provide a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- .7      When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division

## **SELECTIVE DEMOLITION**

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and submit recommendation to Consultant for review.

- .8 Where a change of plane of [6] mm or more occurs, Consultant to review.
- .9 Patch or replace portions of existing surfaces which are damaged, lifted, discoloured, or showing other imperfections.
- .10 Finish surfaces as specified in individual Product sections.

### **1.4 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Procedures for submittals.
- .2 Shop Drawings: Indicate [demolition] [and] [removal sequence and location of salvageable items]; location and construction of temporary work.

### **1.5 SUBMITTALS FOR CLOSEOUT**

- .1 Section 01 78 10: Procedures for submittals.
- .2 Project Record Documents: Accurately record actual locations of capped utilities, subsurface obstructions.

## **SELECTIVE DEMOLITION**

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### **1.6 REGULATORY REQUIREMENTS**

- .1 Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection.
- .2 Obtain required permits from authorities.
- .3 Do not close or obstruct egress width to any building or site exit.
- .4 Do not disable or disrupt building fire or life safety systems without three (3) days prior written notice to Owner.
- .5 Conform to procedures applicable when hazardous or contaminated materials are discovered.

### **1.7 SCHEDULING**

- .1 Section 01 31 00: Project Managing and Coordination.
- .2 Schedule Work according to client approved schedule.
- .3 Describe demolition removal procedures and schedule.
- .4 Perform noisy, malodorous, or dusty work:
  - .1 as agreed with client.

### **1.9 PROJECT CONDITIONS**

- .1 Conduct demolition to minimize interference with adjacent [and occupied] building areas.
- .2 Cease operations immediately if structure appears to be in danger and notify Consultant. Do not resume operations until directed.



## SELECTIVE DEMOLITION

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### Part 2 (Not Used)                      PRODUCTS

### Part 3                      Execution

#### 3.1                      PREPARATION

- .1                      Provide, erect, and maintain temporary [barriers] [[insulated] partitions] at locations indicated.
- .2                      Erect and maintain weatherproof closures for exterior openings.
- .3                      Erect and maintain temporary partitions to prevent spread of dust, odours, and noise to permit continued Owner occupancy.
- .4                      Protect existing materials and surfaces which are not to be demolished.
- .5                      Prevent movement of structure; provide bracing and shoring.
- .6                      Notify affected utility companies before starting work and comply with their requirements.
- .7                      Mark location and termination of utilities.
- .8                      Provide appropriate temporary signage including signage for exit or building egress.

#### 3.2                      DEMOLITION

- .1                      Disconnect [remove,] [cap,] and identify designated utilities within demolition areas. Demolish in an orderly and careful manner. Protect existing supporting structural members.
- .2                      Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.
- .3                      Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.
- .4                      Remove temporary Work.

#### 3.3                      SCHEDULES

- .1                      Remove the following equipment [and materials] for the Owner's retention.
  - .1                      As noted on drawings/ documents.

## **SELECTIVE DEMOLITION**

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.2 Owner will remove and keep the following material and equipment:

.1 As noted on drawings/ documents.

.3 Protect the following materials and equipment remaining:

.1 As noted on drawings/ documents.

**END OF SECTION**

3

**CAST-IN-PLACE CONCRETE**

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**Part 1 General**

**1.1 SECTION INCLUDES**

- .1 Cast-in-place concrete slabs on grade.
- .2 Control, expansion and contraction joint devices associated with concrete work, including embedments and joint sealants.

**1.2 RELATED SECTIONS**

- .1 Section 03 11 00 - Concrete Forming: Formwork and accessories.
- .2 Section 03 20 00 - Concrete Reinforcing.
- .3 Section 03 35 10 - Concrete Floor Finishing.
- .4 Section 05 12 00 - Structural Steel: Steel columns and beams.
- .5 Section 07 92 00 - Joint Sealants.
- .6 Section 32 13 13 - Concrete Paving: Sidewalks, curbs and gutters.

**1.3 UNIT PRICE - MEASUREMENT AND PAYMENT**

- .1 N/A

**1.4 REFERENCES**

- .1 ACI 305R-99 - Hot Weather Concreting.
- .2 ACI 306R-88 - Cold Weather Concreting.
- .3 ASTM A820/A820M-04 - Steel Fibers for Fiber-Reinforced Concrete.
- .4 ASTM B221-04 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- .5 ASTM C260-01 - Air-Entraining Admixtures for Concrete.
- .6 ASTM C330-04 - Lightweight Aggregates for Structural Concrete.
- .7 ASTM C494/C494M-04 - Chemical Admixtures for Concrete.
- .8 ASTM C1017/C 1017M-03 - Chemical Admixtures for Use in Producing Flowing Concrete.

**CAST-IN-PLACE CONCRETE**

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- .9 ASTM D412-98a (Reapproved 2002) - Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
- .10 ASTM D624-00 - Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
- .11 ASTM D994- 98 (Reapproved 2003) - Preformed Expansion Joint Filler for Concrete (Bituminous Type).
- .12 ASTM D1751-04 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
- .13 ASTM D1752-04a - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
- .14 CAN/CSA A438-00 - Concrete Construction for Houses and Small Buildings.
- .15 CAN/CSA A3000-03 - Cementitious Materials Compendium.
- .16 CSA A23.1-04/A23.2-04 - Concrete Materials and Methods of Concrete Construction / Methods of Test and Standard Practices for Concrete.
- .17 CSA A23.3-94 (R2000) - Design of Concrete Structures.
- .18 CSA S269.1-1975 (R2003) - Falsework for Construction Purposes.
- .19 CAN/CSA S269.3-M92 (R2003) - Concrete Formwork.
- .20 CAN/CSA S413-94 (R2000) - Parking Structures.
- .21 CSA S474-94 (R2001) - Concrete Structures.
- .22 W59-03 - Welded Steel Construction (Metal-Arc Welding)
- .23 W186-M1990 (R2002) - Welding of Reinforcing Bars in Reinforced Concrete Construction

**1.5 SUBMITTALS FOR REVIEW**

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide data on joint devices, attachment accessories, and admixtures.
- .3 Samples: Submit two 300 mm long samples of expansion/contraction joint, and control joint.
- .4 Submit certificates to Section 01 33 00.

**CAST-IN-PLACE CONCRETE**

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- .5 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CSA A23.1.
- .6 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CSA A23.1.

**1.6 SUBMITTALS FOR INFORMATION**

- .1 Section 01 33 00: Submission procedures.
- .2 Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent Work.

**1.7 SUBMITTALS AT PROJECT CLOSEOUT**

- .1 Section 01 73 03: Procedures for submittals.
- .2 Accurately record actual locations of embedded utilities and components.

**1.8 QUALITY ASSURANCE**

- .1 Perform Work in accordance with CSA A23.1/A23.2.
- .2 Maintain one copy of each document on site.
- .3 Acquire cement and aggregate from same source for all work.
- .4 Conform to CSA A23.1 and ACI 305R when concreting during hot weather.
- .5 Conform to CSA A23.1 and ACI 306R when concreting during cold weather.

**1.9 MOCK-UP**

- .1 Section 01 43 00: Requirements for mock-up.
- .2 If requested by Consultant, cast concrete against sample panel. Obtain acceptance of resultant surface finish prior to erecting formwork.
- .3 Accepted sample panel is considered basis of quality for the finished work. Keep sample panel exposed to view for duration of concrete work.

**CAST-IN-PLACE CONCRETE**

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**Part 2 Products**

**2.1 CONCRETE MATERIALS**

- .1 Cement: Refer to architectural drawings.

**2.2 ADMIXTURES**

- .1 Air Entrainment: ASTM C260; 8%.

**2.3 ACCESSORIES**

- .1 Non-Premixed Dry Pack Grout: Composition of non metallic aggregate, Portland cement with sufficient water for mixture to retain its shape when made into a ball by hand and capable of developing compressive strength of 48 MPa when measured at 28 days.
- .2 Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 17 MPa (2,460 psi) in 48 hours 48 MPa (7,000 psi) in 28 days.

**2.4 JOINT DEVICES AND FILLER MATERIALS**

- .1 Expansion Joint Devices: ASTM B221/B221M alloy, extruded aluminum; resilient elastomeric neoprene filler strip with a Shore A hardness of 80 to permit plus or minus 25 percent joint movement with full recovery. Black colour

**2.5 CONCRETE MIX**

- .1 Mix and deliver concrete in accordance with CSA A23.1, Alternative 1, to the following criteria:
  - .1 Cement Type: Refer to Architectural drawings.
  - .2 Class of exposure: Refer to Architectural drawings.
  - .3 Compressive Strength: Refer to Architectural drawings.
  - .4 Nominal size of coarse aggregate: 9 mm.
  - .5 Slump at time and point of discharge: 0-25 mm.
  - .6 Air Entrainment: 8% percent.
- .2 Use accelerating admixtures in cold weather only when approved by Consultant. Use of admixtures will not relax cold weather placement requirements.
- .3 Use calcium chloride only when approved by Consultant.

**CAST-IN-PLACE CONCRETE**

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- .4 Use set retarding admixtures during hot weather only when approved by Consultant.
- .5 Add air entraining agent to normal weight concrete mix for work exposed to exterior.

**Part 3 Execution**

**3.1 EXAMINATION**

- .1 Section 01 70 00: Verify existing conditions before starting work.
- .2 Verify all dimensions and locations required on drawings.
- .3 Verify requirements for concrete cover over reinforcement.
- .4 Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not impede concrete placement.
- .5 Verify locations of all openings and embedments required for other structural and architectural work.

**3.2 PREPARATION**

- .1 Prepare previously placed concrete by sanding with abrasive wheel cleaning with high pressure (3000 psi) water blasting and applying bonding agent in accordance with manufacturer's instructions.
- .2 In locations where new concrete is dowelled to existing work, drill holes in existing concrete 6 mm larger than dowel size as shown. Install adhesive anchors and let set in accordance with manufacturers specifications. Manufactured by.
- .3 Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

**3.3 PLACING CONCRETE**

- .1 Place concrete in accordance with CSA A23.1.
- .2 Notify Consultant minimum 24 hours prior to commencement of operations.
- .3 Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.



**CAST-IN-PLACE CONCRETE**

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- .4 Separate slabs on grade from vertical surfaces with 12 mm thick joint filler.
- .5 Place joint filler and secure to resist movement by wet concrete.
- .6 Extend joint filler from bottom of slab to within 6 mm of finished slab surface.
- .7 Install joint devices in accordance with manufacturer's instructions.
- .8 Place concrete continuously between predetermined expansion, control, and construction joints.
- .9 Do not interrupt successive placement; do not permit cold joints to occur.
- .10 Place floor slabs and saw cut pattern indicated on architectural drawings.
- .11 Saw cut joints within 24 hours after placing. Use 5 mm thick blade, cut minimum 12 mm depth of slab thickness.
- .12 Screed slabs on grade level, maintaining surface flatness to CSA A23.1 of maximum 6 mm /3 metre.

**3.4 SEPARATE FLOOR TOPPINGS**

- .1 N/A

**3.5 TOLERANCES**

- .1 Slab and Floor Tolerances: To CSA A23.1, using straightedge method 6mm / 3000mm.

**3.6 CONCRETE FINISHING**

- .1 Finish concrete floor surfaces in accordance with CSA A23.1.
- .2 Steel trowel Fine broom finish surfaces which are scheduled to be exposed.
- .3 In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:50 nominal.

**3.7 CURING AND PROTECTION**

- .1 Cure floor surfaces in accordance with CSA A23.1.
- .2 Ponding: Maintain 100 percent coverage of water over floor slab areas continuously for 4 days.
- .3 Spraying: Spray water over floor slab areas and maintain wet cure for 7 days.

**CAST-IN-PLACE CONCRETE**

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**3.8 FIELD QUALITY CONTROL**

- .1 Section 01 45 00: Field inspection and testing.
- .2 Provide free access to Work and cooperate with appointed firm.
- .3 Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.
- .4 Tests of cement and aggregates may be performed to ensure conformance with specified requirements.
- .5 One slump or flow test and one air test will be taken for each set of test cylinders.

**3.9 PATCHING**

- .1 Allow Consultant to inspect concrete surfaces immediately upon removal of forms.
- .2 Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Consultant upon discovery.
- .3 Patch imperfections [as directed.] [in accordance with CSA 23.1.

**3.10 DEFECTIVE CONCRETE**

- .1 Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- .2 Repair or replacement of defective concrete will be determined by the Consultant.
- .3 Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Consultant for each individual area.

**3.11 SCHEDULE - CONCRETE TYPES AND FINISHES**

- .1 Foundation Walls: 25 MPa (3625 psi) 28 day concrete, form finish with honeycomb filled surface.
- .2 Underside of Supported Floors and Structure Exposed to View: 30 MPa (4,350 psi) 28 day concrete, sack rubbed finish.

**END OF SECTION**

## **POLISHED CONCRETE FLOOR FINISH**

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### **1 GENERAL**

#### **1.1 SECTION INCLUDES**

- .1 Surface preparation.
- .2 Application of clear, colourless, liquid concrete hardener and densifier.
- .3 Grind and polish of floor to desired finish.
- .4 Application of water-based concrete enhancer.

#### **1.2 RELATED SECTIONS**

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

#### **1.3 REFERENCES**

- .1 ASTM C779 - Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
- .2 ASTM F609 - Standard Test Method for Using a Horizontal Pull Slipmeter (HPS).

#### **1.4 SUBMITTALS**

- .1 Comply with Section 01 33 00 - Submittal Procedures.
- .2 Submit manufacturer's product data and application instructions.
- .3 Provide documentation showing finisher is certified by the polishing and densifier manufacturer.
- .4 Contact manufacturer or supplier for a list of certified applicators.

#### **1.5 QUALITY ASSURANCE**

- .1 Installer Qualifications
  - .1 Use an experienced installer and adequate number of skilled personnel who are thoroughly trained and experienced in the floor treatment.
  - .2 The applicator shall either:
    - .1 An INDUROSHINE approved applicator as certified by W. R. MEADOWS, having a minimum of 10 projects performed within three years of similar type, size and complexity as this contract.
    - .2 Be a Level 2 INDUROSHINE approved applicator by W. R. MEADOWS.

## **POLISHED CONCRETE FLOOR FINISH**

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- .2 Mock-Ups
  - 1. Apply mock-up of required finish to demonstrate surface finish, color variations and to determine a level of workmanship.
  - 2. Build mock-up in the location and dimensions as directed by the architect or owner's representative.
  - 3. Prior to proceeding, ensure that mock-up meets all requirements of the architect or owner's representative.
  - 4. Maintain mock-up during construction in an undisturbed condition as a standard for judging the work.
- .3 Provide name of technically qualified concrete polishing field representative.
- .4 Provide name of technically qualified densifier manufacturer's field representative.
- .5 Ensure that correct amount of densifier is onsite.

### **1.6 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- .2 Store materials in a clean dry area in accordance with manufacturer's instructions.
- .3 Keep products from freezing.
- .4 Avoid direct contact with this product as it may cause mild to moderate irritation of the eyes and/or skin.
- .5 Protect materials during handling and application to prevent damage or contamination.

### **1.7 ENVIRONMENTAL REQUIREMENTS**

- .1 Do not apply product when air, surface, or material temperatures are expected to fall below 4° C (40° F) within four hours of expected application.
- .2 Do not apply to frozen concrete.
- .3 Do not use on highly dense or non-porous surfaces.
- .4 Limit and control damage from excessive dust caused by grinding/polishing procedure.
- .5 Properly dispose of collected dry dust from polishing.

## **POLISHED CONCRETE FLOOR FINISH**

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### **2 PRODUCTS**

#### **2.1 MANUFACTURER**

- .1 W. R. MEADOWS OF CANADA, 70 Hannant Court, Milton, Ontario, Canada L9T 5C1.  
(800) 563-3618. Fax (905) 878-4125. Web Site [www.wrmeadows.com](http://www.wrmeadows.com).

#### **2.2 MATERIALS**

- .1 Equipment to be used for grinding/polishing shall be:
  - .1 Three-head counter rotating variable speed floor grinding machine.
  - .2 Dust extraction system and pre-separator.
  - .3 75kw MQ power generator or equivalent.
- .2 Equipment to be used for grinding/polishing shall possess at least 775 lb. of head pressure.
- .3 Equipment to be used for edge grinding/polishing shall be a hand grinder with dust extraction equipment
- .4 Diamond grinding segments shall be:
  - .1 Metal bonds: 40, 60, 80 and 150 grit.
- .5 Diamond polishing pads shall be:
  - .1 Resin bonds: 100, 200, 400, 800, 1500, and 3000 grit.
- .6 Grinding pads for edges shall be:
  - .1 Resin bonds: 40, 60, 80, 100, 200, 400, 800, 1500, and 3000 grit.
- .7 Equipment to be used for densifying and cleaning the floor after grinding/polishing procedure has been performed:
  - .1 Tennant ride-on auto-scrubber or equivalent with a head pressure of 150 lb.
  - .2 Follow auto-scrubber's manual for cleaning instructions after densifying and conditioning the floor.
  - .3 Do not allow densifier to remain inside the auto-scrubber after densifying.
- .8 Concrete densifier:
  - .1 Liquid hardener/densifier shall be LIQUI-HARD as manufactured by W. R. MEADOWS.
- .9 Concrete Enhancer:
  - .1 Water-based, synthetic polymer concrete floor enhancer shall be BELLATRIX as manufactured by W.R. MEADOWS.

## **POLISHED CONCRETE FLOOR FINISH**

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### **2.3 RELATED MATERIALS**

- .1 Water: Potable water.

### **3 EXECUTION**

#### **3.1 EXAMINATION**

- .1 Examine surfaces to receive treatment. Notify architect if surfaces are not acceptable. Do not begin application until unacceptable conditions have been corrected.
- .2 Final sheen shall be equivalent to that as accepted on the mock-up.

#### **3.2 GENERAL POLISHING REQUIREMENTS**

- .1 Coordinate polishing operations with other associated work and trades.
- .2 Do not use stain or scuff removing agents.
- .3 Begin and complete polishing within two weeks prior to possession date.
- .4 Utilize machines to the maximum extent practical to achieve optimum efficiency.

#### **3.3 SURFACE PREPARATION**

- .1 Protect adjacent surfaces not designated to receive treatment.
- .2 Clean and prepare surfaces to receive treatment in accordance with manufacturer's instructions, ensuring that all stains, oil, grease, form release agents, dust and dirt are removed prior to application.
- .3 Ensure concrete is a minimum of 28 days old.

#### **3.4 APPLICATION**

- .1 To obtain satin finish that will reflect images from side lighting (INDUROSHINE PDS-1), ensure applicator follows the applicable procedures incorporating grinding plates in the following order.
  - .1 Verify that the floor is clean and dry prior to polishing procedure.
  - .2 Inspect and verify that the floor does not have curled joints, large cracks, spalling or lippage. If lippage or curled joints are present, refer to Section 03 01 00 – Maintenance of Concrete for corrective procedures.
  - .3 Using the 80-grit metal bond grinding segment, grind the floor surface at a rate of 500 ft.<sup>2</sup>/hr. Vacuum the surface to remove loose particulates.

## **POLISHED CONCRETE FLOOR FINISH**

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- .4 Using the 150-grit metal bond grinding segment, grind the floor surface at a rate of 600 ft.<sup>2</sup>/hr. Vacuum the surface to remove loose particulates.
- .5 Flood surface with concrete densifier and scrub into floor for 45 minutes, ensuring that no puddling of densifier occurs.
- .6 Squeegee off excess material.
- .7 Wait 24 hours.
- .8 Verify that the floor is dry and clear of debris prior to continuation of polishing procedure.
- .9 Using the 100-grit resin bond polishing segment, grind the floor surface at a rate of 600 ft.<sup>2</sup>/hr. If scratches from the previous grit are still apparent, decrease the rate of grinding by 100 ft.<sup>2</sup> until scratches are removed. Vacuum the surface to remove loose particulates.
- .10 Using the 200-grit resin bond polishing segment, grind the floor surface at a rate of 700 ft.<sup>2</sup>/hr. If scratches from the previous grit are still apparent, decrease the rate of grinding by 100 ft.<sup>2</sup> until scratches are removed. Vacuum the surface to remove loose particulates.
- .11 Using the 400-grit resin bond polishing segment, grind the floor surface at a rate of 700 ft.<sup>2</sup>/hr. If scratches from the previous grit are still apparent, decrease the rate of grinding by 100 ft.<sup>2</sup> until scratches are removed. Vacuum the surface to remove loose particulates.
- .12 Using the 800-grit resin bond polishing segment, grind the floor surface at a rate of 1000 ft.<sup>2</sup>/hr. If scratches from the previous grit are still apparent, decrease the rate of grinding by 100 ft.<sup>2</sup> until scratches are removed. Vacuum the surface to remove loose particulates.
- .13 Using the auto-scrubber, clean the floor thoroughly as per manufacturer's instructions with a white non-woven pad. Pads should be replaced approximately every 30,000 ft<sup>2</sup>.

### **3.5 CONCRETE ENHANCER**

- .1 Allow 24 hours before proceeding with concrete enhancer application.
- .2 Apply concrete enhancer, undiluted, according to manufacturer's instructions.
- .3 Spray concrete enhancer using industrial sprayer delivering 1/10<sup>th</sup> of a gallon per minute.
- .4 Pre-wet micro-fiber applicator with concrete enhancer prior to use.
- .5 Uniformly spread concrete enhancer with a micro-fiber applicator, ensuring that the product is not allowed to dry before spreading is complete.
- .6 Allow concrete enhancer to set up for two hours, then burnish with a 3000-grit diamond pad at 2000 RPM.
- .7 For optimum performance, apply a second coat at a 90° (right) angle to the first coat, after the first coat is thoroughly dry.

## **POLISHED CONCRETE FLOOR FINISH**

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### **3.6 PROTECTION**

- .1 Keep surface dry for a minimum of 48 hours after application.
- .2 Allow 72 hours before heavy traffic.

### **3.7 Clean up**

- 3.7.1 Remove debris and excess Products from the Place of the Work.

**END OF SECTION**



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**COMMON WORK RESULTS FOR MASONRY**

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**Part 1            General**

**1.1            RELATED SECTIONS**

- .1      Section 01 29 83 - Payment Procedures for Testing Laboratory Services.
- .2      Section 01 33 00 - Submittal Procedures.
- .3      Section 01 43 39 - Mock Up Requirements.
- .4      Section 01 45 00 - Quality Control.
- .5      Section 01 61 00 - Common Product Requirements.
- .6      Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7      Section 03 30 00 - Cast-in-Place Concrete.
- .8      Section 04 05 13 - Masonry Mortar and Grout.
- .9      Section 04 05 19 - Masonry Anchorage and Reinforcing.
- .10     Section 04 05 23 - Masonry Accessories.
- .11     Section 04 21 13 - Brick Masonry.
- .12     Section 04 22 00 - Concrete Unit Masonry.
- .13     Section 04 23 00 - Glass Unit Masonry.
- .14     Section 05 50 00 - Metal Fabrications.
- .15     Section 07 21 13 - Board Insulation.
- .16     Section 07 92 00 - Joint Sealants.

**1.2            REFERENCES**

- .1      Canadian Standards Association (CSA International).
  - .1      CSA-A165 Series, Standards on Concrete Masonry Units.
  - .2      CSA A179, Mortar and Grout for Unit Masonry.
  - .3      CSA-A371, Masonry Construction for Buildings.
- .2      International Masonry Industry All-Weather Council (IMIAC).

**COMMON WORK RESULTS FOR MASONRY**

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- .1 Recommended Practices and Guide Specification for Cold Weather Masonry Construction.

**1.3 SUBMITTALS**

- .1 Product Data.
  - .1 Submit manufacturer's printed product literature, specifications and data, including product characteristics, performance criteria, limitations and colors.
  - .2 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) - Safety Data Sheets (SDS).
  - .3 Samples.
    - .1 Submit samples:
      - .1 Two of each type of masonry unit specified including special shapes.
      - .2 One of each cured and coloured samples of mortar and grout, illustrating mortar colour and colour range.
      - .3 One of each type of masonry accessory specified.
      - .4 One of each type of masonry reinforcement, tie and connector proposed for use.
    - .2 Submit samples tested to laboratories employing technicians certified/trained in procedures for testing masonry units.
    - .3 Samples used for testing, when accepted, become standard for material used.
  - .4 Shop drawings.
    - .1 Provide drawings stamped and signed by professional engineer licensed in Province of Newfoundland and Labrador, Canada.
    - .2 Provide confirmation to Owner that temporary bracing and support has been designed by professional engineer.
  - .5 Manufacturer's Instructions.
    - .1 Submit manufacturer's installation instructions.

**1.4 QUALITY ASSURANCE**

- .1 Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements.
- .2 Submit certified test reports showing compliance with specified performance characteristics and physical properties.

## **COMMON WORK RESULTS FOR MASONRY**

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- .3 For clay units, in addition to requirements set out in referenced CSA and ASTM Standards include data indicating initial rate of absorption.
- .4 Qualifications:
  - .1 Manufacturer: minimum five (5) years experience in manufacturing components similar to or exceeding requirements of project.
  - .2 Installer: experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
  - .3 Masons: company or person specializing in masonry installations with minimum five (5) years documented experience with masonry work similar to this project.
    - .1 Masons employed on this project must demonstrate ability to reproduce mock-up standards.

### **1.5 JOB MOCK-UPS.**

- .1 Construct mock-ups in accordance with Section 01 43 39 – Mock Up Requirements.
- .2 Construct mock-up panel of exterior masonry wall construction 1200 x 1800 mm showing masonry colours and textures, use of reinforcement, ties, through-wall flashing, weep holes, jointing, coursing, mortar and workmanship.
- .3 Construct mock-up where directed.

### **1.6 DELIVERY, STORAGE, AND HANDLING**

- .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials to job site in dry condition.
- .3 Keep materials dry until use except where wetting of bricks is specified
- .4 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.
- .5 Replace defective or damaged materials with new.

### **1.7 SITE CONDITIONS**

- .1 Cold weather requirements.
  - .1 In accordance with CSA-A371 and as outlined below.
    - .1 Maintain temperature of mortar between 5°C and 50°C until batch is used or becomes stable.

**COMMON WORK RESULTS FOR MASONRY**

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- .2 Maintain ambient temperature of masonry work and its constituent materials between 5°C and 50°C and protect site from exposure to wind.
  - .3 Maintain temperature of masonry above 0°C for minimum of 3 days, after mortar is installed.
  - .4 Preheat unheated wall sections in enclosure for minimum 72 hours about 10°C, before applying mortar.
- .2 Hot weather requirements.
  - .1 In accordance with CSA-A371 and as outlined below.
    - .1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.
    - .2 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.
  - .3 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.
  - .4 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

**Part 2      PRODUCTS**

**2.1        MATERIALS**

- .1 Masonry materials are specified in related Sections indicated in 1.1.

**Part 3      EXECUTION**

**3.1        MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

**3.2        PREPARATION**

- .1 Provide temporary bracing and support of masonry work during and after erection until permanent lateral support is in place.
- .2 Bracing approved by Owner.
- .3 Establish and protect lines, levels, and coursing.

**COMMON WORK RESULTS FOR MASONRY**

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- .4 Protect adjacent materials from damage and disfiguration.

**3.3 INSTALLATION**

- .1 Do masonry work in accordance with CSA-A371, except where specified otherwise.
- .2 Build masonry plumb, level, and true to line, with vertical joints in alignment respecting construction tolerances permitted by CAN/CSA-A371.
- .3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

**3.4 CONSTRUCTION**

- .1 Exposed masonry:
  - .1 Remove chipped, cracked, and otherwise damaged units, in accordance with CSA A-165, in exposed masonry and replace with undamaged units.
- .2 Jointing:
  - .1 Allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, joints true to line, compressed, uniformly concave joints where concave joints are indicated.
  - .2 Strike flush joints concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating.
- .3 Cutting:
  - .1 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.
  - .2 Make cuts straight, clean, and free from uneven edges.
- .4 Building-In:
  - .1 Build in items required to be built into masonry.
  - .2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.
  - .3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.
- .5 Wetting of bricks:
  - .1 Except in cold weather, wet bricks having an initial rate of absorption exceeding 1 g/minute/1000 mm<sup>2</sup>: wet to uniform degree of saturation, 3 to 24 hours before laying, and do not lay until surface dry.

**COMMON WORK RESULTS FOR MASONRY**

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- .2 Wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.
- .6 Support of loads:
  - .1 Use 30 MPa concrete to Section 03 30 00 - Cast-in-Place Concrete, where concrete fill is used in lieu of solid units.
  - .2 Use grout to CSA A179, where grout is used in lieu of solid units.
  - .3 Install building paper below voids to be filled with grout; keep paper 25 mm back from faces of units.
- .7 Provision for movement:
  - .1 Leave 3 mm space below shelf angles.
  - .2 Leave 6 mm space between top of non-load bearing walls and partitions and structural elements. Do not use wedges.
  - .3 Built masonry to tie in with stabilizers, with provision for vertical movement.
- .8 Loose steel lintels:
  - .1 Install loose steel lintels. Centre over opening width.
- .9 Control joints:
  - .1 Construct continuous control joints where indicated or detailed.
- .10 Expansion joints:
  - .1 Build-in continuous expansion joints where indicated or detailed.

**3.5 SITE TOLERANCES**

- .1 Tolerances in notes to CSA-A371 apply.

**3.6 FIELD QUALITY CONTROL**

- .1 Inspection and testing will be carried out by Testing Laboratory designated by Owner.
- .2 Owner will pay costs for testing, as specified in Section 01 29 83 – Payment Procedures for Testing Laboratory Services.
- .3 Cost of testing will be paid from cash allowance specified in Section 01 21 00 - Allowances. Re-testing as a result of deficient work will be paid for by contractor, credit change order.
- .4 Provide Certificate of Field Quality Inspection and testing to Owner for inclusion in Commissioning Manual.

**COMMON WORK RESULTS FOR MASONRY**

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**3.7 CLEANING**

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**3.8 PROTECTION**

- .1 Temporary Bracing and Supports:
  - .1 Provide temporary bracing and supports of masonry work during and after erection until permanent lateral support is in place.
  - .2 Provide confirmation to Owner that temporary bracing and support has been designed by professional engineer.
  - .3 Brace masonry walls as necessary to resist wind pressure and lateral forces during construction.
- .2 Moisture Protection:
  - .1 Keep masonry dry using waterproof, nonstaining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until completed and protected by flashing or other permanent construction.
  - .2 Cover completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day. Anchor securely in position.
  - .3 Air Temperature Protection: protect completed masonry as per Part 1 article Site Conditions.

**END OF SECTION**



**MASONRY MORTAR AND GROUT**

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**Part 1 GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Section 04 05 00 - Common Work Results for Masonry.
- .4 Section 04 22 00 - Concrete Unit Masonry.

**1.2 REFERENCES**

- .1 American Standards for Testing and Materials (ASTM)
  - .1 ASTM C1072, Standard Test Methods for Measurement of Masonry Flexural Bond Strength.
  - .2 ASTM C1384, Standard Specification for Admixtures for Masonry Mortar.
  - .3 ASTM E514, Standard Test Method for Water Penetration and Leakage through Masonry.
- .2 Canadian Standards Association (CSA)
  - .1 CAN/CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA A179, Mortar and Grout for Unit Masonry.
  - .3 CAN/CSA A371, Masonry Construction for Buildings.
  - .4 CAN/CSA-A3000, Cementitious Materials Compendium; CAN/CSA-A3002, Masonry and Mortar Cement.

**1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet including product characteristics, performance criteria, and limitations.
  - .2 Submit copy of WHMIS SDS Safety Data Sheets. Indicate VOC's mortar, grout, parging, colour additives and admixtures, expressed as grams per litre (g/L).
- .2 Samples:
  - .1 Submit two samples of mortar showing actual product colour when set.
- .3 Manufacturer's Instructions:

**MASONRY MORTAR AND GROUT**

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- .1 Submit manufacturer's installation instructions.
- .4 Certificate:
  - .1 Submit certificate from masonry installer stating the only mortar containing specified water-repellant admixture at the manufacturer's recommended dosage has been used for construction of water-repellent masonry.
- 1.4 QUALITY ASSURANCE**
  - .1 Submit test reports showing compliance with specified performance characteristics and physical properties.
- 1.5 DELIVERY, STORAGE AND HANDLING**
  - .1 Deliver, store and handles masonry mortar and grout materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
    - .1 Deliver prepackaged, dry-blended mortar mix to project site in labelled plastic-lined bags each bearing name and address of manufacturer, production codes or batch numbers, and color or formula numbers.
    - .2 Maintain mortar, grout and packaged materials clean, dry, and protected against dampness, freezing, traffic and contamination by foreign materials.
    - .3 Store integral water-repellent mortar admixture in an area where temperature is maintained between 4° C and 43° C. Do not allow integral water-repellent mortar admixture to freeze. Discard any frozen admixture.
- 1.6 SITE CONDITIONS**
  - .1 Ambient Conditions: maintain materials and surrounding air temperature to:
    - .1 Minimum 5° C prior to, during, and 48 hours after completion of masonry work.
    - .2 Maximum 32° C prior to, during, and 48 hours after completion of masonry work.
- Part 2 PRODUCTS**
  - 2.1 MATERIALS**
    - .1 Use same brands of materials and source of aggregate for entire project.
    - .2 Cement:

## **MASONRY MORTAR AND GROUT**

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- .1 Portland Cement: to CAN/CSA-A3000. Use VOC products to limits listed in Section 01 35 21 - LEED® Requirements.
  - .2 Masonry Cement: to CAN/CSA-A3002 and CAN/CSA A179.
  - .3 Mortar Cement: to CAN/CSA-A3002 and CAN/CSA A179.
  - .4 Packaged Dry Combined Materials for mortar: to CAN/CSA A179, using gray color cement.
- .3 Aggregate: supplied by one supplier.
- .1 Fine Aggregate: to CAN/CSA A179, natural sand.
  - .2 Course Aggregate: to CAN/CSA A179.
- .4 Water: clean and potable.

### **2.2 COLOR ADDITIVES**

- .1 Use coloring admixture not exceeding 10% of cement content by mass, or integrally colored masonry cement, to produce colored mortar to match approved sample. Admixtures to be approved prior to use. Use in accordance with the specific manufacturer's recommendations. Mortar color sample as selected from manufacturer's standard color range.
- .2 White mortar: use white masonry cement to produce mortar type specified.

### **2.3 INTEGRAL WATER-REPELLENT MORTAR ADMIXTURE**

- .1 Integral liquid polymeric water-repellent admixture for mortar added to the mortar at the time of mixing for use in the construction of water-repellent concrete masonry.
  - .1 Performance requirements:
    - .1 Water Permeance: to ASTM E514. Capable of achieving a Class E Rating with the test extended to 72 hours, using the rating criteria specified in ASTM E514-74.
    - .2 Flexural Bond Strength: to ASTM C1072. No statistically lower masonry flexural bond strength shall occur as a result of adding integral water-repellent CMU and mortar admixtures when compared to a control (containing no admixtures) CMU and mortar.
    - .3 Water Repellent Mortar Admixture Classification: to ASTM C1384. Capable of meeting all of the requirements of a water repellent classification.

### **2.4 MORTAR MIXES**

- .1 Mortar for exterior masonry above grade:
  - .1 Loadbearing: Type S based on proportion specifications.

## **MASONRY MORTAR AND GROUT**

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- .2 Non-Loadbearing: Type N based on proportion specifications.
- .2 Mortar for interior masonry:
  - .1 Loadbearing: Type S based on proportion specifications.
  - .2 Non-Loadbearing: Type N based on proportion specifications.
- .3 Mortar for Parapet walls, chimneys, unprotected walls: Type S based on proportion specifications.
- .4 Pointing Mortar: CAN/CSA A179, Type N using property specification with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
- .5 Stain Resistant Pointing Mortar: one part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate to 2 percent of Portland cement by weight.
- .6 Mortar for Glass Block Masonry: CAN/CSA A179, Type S, using the property specification.
- .7 Pointing Mortar for Glass Block Masonry: CAN/CSA A179, Type S, using the property specification; with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
- .8 Parging mortar: Type N to CAN/CSA A179.
- .9 Mortar for foundation walls, manholes, sewers, pavements, walks, patios and other exterior masonry at or below grade: Type M based on proportion specifications.
- .10 Following applies regardless of mortar types and uses specified above:
  - .1 Mortar for calcium silicate brick and concrete brick: Type N based on proportion specifications.
  - .2 Mortar for stonework: Type N based on proportion specifications.
  - .3 Mortar for grouted reinforced masonry: Type S based on proportion specifications.

### **2.5 MORTAR MIXING**

- .1 Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
- .2 Use a batch type mixer in accordance with CAN/CSA A179.
- .3 Pointing mortar: prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour no more

**MASONRY MORTAR AND GROUT**

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than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.

- .4 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.
- .5 Use mortar within 2 hours after mixing at temperatures of 32° C, or 2-1/2 hours at temperatures under 5° C.

**2.6 GROUT MIXES**

- .1 Bond Beams: minimum grout mix 10 to 12.5 MPa strength at 28 days or as otherwise indicated on drawings; 200-250 mm slump; mixed in accordance with CAN/CSA A179.
- .2 Lintels: minimum grout mix 10 to 12.5 MPa strength at 28 days or as otherwise indicated on drawings; 200-250 mm slump; mixed in accordance with CAN/CSA A179.
- .3 Grout: minimum compressive strength of 12.5 MPa at 28 days or as otherwise indicated on drawings. Maximum aggregate size and grout slump: CAN/CSA A179.

**2.7 GROUT MIXING**

- .1 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA A179.
- .2 Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- .3 Do not use calcium chloride or chloride based admixtures.

**Part 3 EXECUTION**

**3.1 EXAMINATION**

- .1 Verify that conditions of substrate are acceptable for masonry installation in accordance with manufacturer's written instructions.
- .2 Visually inspect substrate in presence of Owner.
- .3 Inform Owner of unacceptable conditions immediately upon discovery.
- .4 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Owner.

## **MASONRY MORTAR AND GROUT**

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### **3.2 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### **3.3 CONSTRUCTION**

- .1 Do masonry mortar and grout work in accordance with CSA A179, except where specified otherwise.
- .2 Apply parging in uniform coating of thickness indicated.
- .3 Installer shall use only masonry units containing a compatible integral water-repellent admixture added to the concrete masonry units (CMU) at the time of manufacture for construction of water-repellent masonry walls.
- .4 Installer shall use only mortar containing integral liquid polymeric water-repellent admixture at the manufacturer's recommended addition rate and mixed according to the manufacturer's recommended instructions for construction of water-repellent masonry walls.
- .5 Installing Units: Use face bedding to provide the greatest resistance to water penetration.

### **3.4 MIXING**

- .1 All pointing mortar can be mixed using a regular paddle mixer. Only electric motor mixers are permissible. Mixers run on hydrocarbons are not permitted, due to fumes. Mixing by hand must be pre-approved by the Owner.
- .2 Clean all mixing boards and mechanical mixing machine between batches.
- .3 Mortar must be weaker than the units it is binding.
- .4 Contractor to appoint one individual to mix mortar, for duration of project. In the event that this individual must be changed, mortar mixing must cease until the new individual is trained, and mortar mix is tested.

### **3.5 MORTAR PLACEMENT**

- .1 Install mortar to manufacturer's instructions.
- .2 Install mortar to requirements of CAN/CSA A179.
- .3 Remove excess mortar from grout spaces.
- .4 Mortar Joint Tooling:

## **MASONRY MORTAR AND GROUT**

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- .1 Tool mortar joints to concave or V-profile to provide the greatest resistance to water penetration.
- .2 Do not use raked, flush, extruded, struck, beaded weather or other joint profiles to due to their reduced water-resistance.
- .3 Tool mortar joints when they are thumbprint hard to provide the greatest resistance to water penetration and to help minimize hairline cracks between mortar and CMU.

### **3.6 GROUT PLACEMENT**

- .1 Install grout in accordance with manufacturer's instructions.
- .2 Install grout in accordance with CAN/CSA A179.
- .3 Work grout into masonry cores and cavities to eliminate voids.
- .4 Do not install grout in lifts greater than 400 mm, without consolidating grout by rodding.
- .5 Do not displace reinforcement while placing grout.

### **3.7 CLEANING**

- .1 In-Progress Cleaning: Promptly remove excess wet mortar containing integral water-repellent mortar admixture from face of masonry as work progresses by dry brushing.
- .2 Clean masonry once mortar is set and cured.
- .3 Cover top of unfinished masonry work to protect it from the weather and to prevent accumulation of water in CMU cores.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .5 Remove droppings and splashings using clean sponge and water.
- .6 Clean masonry with low pressure clean water and soft natural bristle brush.

**END OF SECTION**

**MASONRY ANCHORAGE AND REINFORCING**

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**Part 1 GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Section 04 05 00 - Common Work Results for Masonry.
- .4 Section 04 05 13 - Masonry Mortar and Grout.
- .5 Section 04 05 23 - Masonry Accessories.
- .6 Section 04 21 13 - Brick Masonry.
- .7 Section 04 22 00 - Concrete Unit Masonry.

**1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International).
  - .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA-A370, Connectors for Masonry.
  - .3 CSA-A371, Masonry Construction for Buildings.
  - .4 CSA G30.18, Carbon Steel Bars for Concrete Reinforcement.
  - .5 CSA S304.1, Design of Masonry Structures.
  - .6 CSA A179, Mortar and Grout For Unit Masonry.
  - .7 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .2 Reinforcing Steel Institute of Canada (RSIC).
  - .1 Reinforcing Steel Manual of Standard Practice.

**1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet.
  - .2 Submit two copies of WHMIS SDS - Safety Data Sheets. Indicate VOC's for epoxy coatings and galvanized protective coatings and touch-up products illustrating products to be incorporated into project for specified products.



## **MASONRY ANCHORAGE AND REINFORCING**

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- .2 Shop Drawings:
  - .1 Shop drawings consist of bar bending details, lists and placing drawings. Provide shop drawings detailing bar bending details, anchorage details, lists and placing drawings.
  - .2 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.
  - .3 Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and mechanical splices if approved by Owner, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacings and locations of chairs, spacers and hangers. Prepare reinforcement drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Canada. ANSI/ACI 315 and ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.
- .3 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

### **1.4 SITE MEASUREMENTS**

- .1 Make site measurements necessary to ensure proper fit of members.

## **Part 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Bar reinforcement: to CSA-A371, and CAN/CSA G30.18, Grade 400.
- .2 Wire reinforcement: to CSA-A371, and CSA S304.1, two wire ladder or truss type, galvanized.
- .3 Ties:
  - .1 For metal stud or wood stud and masonry construction: to CSA-A370 and CSA-S304, 1.6 mm thick side mounting, stainless steel flat plate, c/w 5.8 mm  $\emptyset$  holes for veneer tire wire attachment, 4.76 mm  $\emptyset$  veneer ties with polyethylene insulation supports. Total length of flat plate to suit stud width, sheathing, air space and insulation.
  - .2 For cast-in-place concrete and masonry construction: to CSA-A370 and CSA-S304, 1.6 mm thick stainless steel L-Plate, c/w 5.8 mm  $\emptyset$  holes for veneer tire wire attachment, 4.76 mm  $\emptyset$  veneer ties with polyethylene insulation supports.
  - .3 For concrete block and masonry construction: to CSA-A370 and CSA-S304, 1.6 mm thick stainless steel connector plate, c/w 5.8 mm  $\emptyset$  holes for veneer tire wire attachment, 4.76 mm  $\emptyset$  veneer ties with polyethylene

## **MASONRY ANCHORAGE AND REINFORCING**

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insulation supports. Total length of connector plate to suit block width, air space and insulation.

- .4 Corrosion protection for wire reinforcement: to CSA S304.1, galvanized to CSA S304.1 and CSA-A370.

### **2.2 FABRICATION**

- .1 Fabricate reinforcing in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Fabricate connectors in accordance with CSA-A370.
- .3 Obtain Owner's approval for locations of reinforcement splices other than shown on placing drawings.
- .4 Upon approval of Owner, weld reinforcement in accordance with CSA W186.
- .5 Ship reinforcement and connectors, clearly identified in accordance with drawings.

### **2.3 SOURCE QUALITY CONTROL**

- .1 Upon request, provide Owner with certified copy of mill test report of reinforcement steel and connectors, showing physical and chemical analysis, minimum 5 weeks prior to commencing reinforcement work.
- .2 Upon request inform Owner of proposed source of material to be supplied.

## **Part 3 EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### **3.2 GENERAL**

- .1 Supply and install masonry connectors and reinforcement in accordance with CSA-A370, CSA-A371, CSA-A23.1/A23.2, and CSA-S304.1, unless indicated otherwise.
- .2 Prior to placing concrete, mortar, obtain Owner's approval of placement of reinforcement and connectors.
- .3 Supply and install additional reinforcement to masonry as indicated.

## **MASONRY ANCHORAGE AND REINFORCING**

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### **3.3 BONDING AND TYING**

- .1 Bond walls of two or more wythes using metal connectors in accordance with CSA S304.1, CSA-A371, and as indicated.
- .2 Tie masonry veneer to backing in accordance with NBC, CSA-S304.1, CSA-A371, and as indicated.

### **3.4 REINFORCED LINTELS AND BOND BEAMS**

- .1 Reinforce masonry lintels and bond beams as indicated.
- .2 Place and grout reinforcement in accordance with CSA-S304.1, CSA-A371 and CSA-A179.
- .3 Support and position reinforcing bars in accordance with CAN/CSA A371.

### **3.5 GROUTING**

- .1 Grout masonry in accordance with CSA-S304.1, CSA-A371 and CSA-A179, and as indicated.

### **3.6 ANCHORS**

- .1 Supply and install metal anchors as indicated.

### **3.7 LATERAL SUPPORT AND ANCHORAGE**

- .1 Supply and install lateral support and anchorage in accordance with CSA-S304.1 and as indicated.

### **3.8 MOVEMENT JOINTS**

- .1 Reinforcement will not be continuous across movement joints unless otherwise indicated.

### **3.9 FIELD BENDING**

- .1 Do not field bend reinforcement and connectors except where indicated or authorized by Owner.
- .2 When field bending is authorized, bend without heat, applying a slow and steady pressure.
- .3 Replace bars and connectors which develop cracks or splits.

**MASONRY ANCHORAGE AND REINFORCING**

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**3.10 FIELD TOUCH-UP**

- .1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcement steel and connectors with compatible finish to provide continuous coating.

**3.11 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

**MASONRY ACCESSORIES**

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**Part 1 GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Section 04 05 00 - Common Work Results for Masonry.
- .4 Section 04 05 19 - Masonry Anchorage and Reinforcing.

**1.2 REFERENCES**

- .1 American Society for Testing and Materials, (ASTM).
  - .1 ASTM D2240, Standard Test Method for Rubber Property - Durometer Hardness.
- .2 Canadian Standards Association (CSA)
  - .1 CSA-A371, Masonry Construction for Buildings.

**1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data including product characteristics, performance criteria, and limitations.
  - .2 Submit two copies of WHMIS SDS - Safety Data. Indicate VOC's for joint fillers and lap adhesives.
- .2 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

**1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle masonry accessories in accordance with, Section 01 61 00 - Common Product Requirements supplemented as follows:
  - .1 Keep fillers and adhesives dry, protected against dampness, and freezing.
  - .2 Store packaged materials off ground and in accordance with manufacturer's written instructions.

**MASONRY ACCESSORIES**

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**Part 2        PRODUCTS**

**2.1        MATERIALS**

- .1        Control joint filler: purpose-made elastomer 70 durometer hardness to ASTM D2240 of size and shape indicated. Use VOC products to limits listed in Section 01 35 21 - LEED® Requirements.
- .2        Lap adhesive: recommended by masonry flashing manufacturer. Use VOC products to limits listed in Section 01 35 21 - LEED® Requirements.
- .3        Weep hole vents: purpose-made PVC.
- .4        Cavity Wall Flashing:
  - .1        Self adhering SBS rubberized asphalt compound integrally laminated to cross-laminated polyethylene film, minimum thickness 1.0 mm.
  - .2        Primer: as per manufacturer's recommendation.
- .5        Trash mortar diverters: shaped and sized to suit cavity spaces.

**Part 3        EXECUTION**

**3.1        MANUFACTURER'S INSTRUCTIONS**

- .1        Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

**3.2        INSTALLATION**

- .1        Install continuous control joint fillers in control joints at locations indicated on drawings.
- .2        Lap adhesive: apply adhesive to flashing lap joints.
- .3        Reglets: install reglets at locations indicated on drawings.
- .4        Install weep hole vents in vertical joints immediately over flashings, in exterior wythes of cavity wall and masonry veneer wall construction, at maximum horizontal spacing of 600 mm on centre.
- .5        Trash mortar diverters: install purpose made diverters in cavities where indicated and as directed, size and shape to suit purpose and function.

**3.3        CONSTRUCTION**

- .1        Build in flashings in masonry in accordance with CSA-A371 as follows:

## **MASONRY ACCESSORIES**

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- .1 Install flashings under exterior masonry bearing on foundation walls, slabs, shelf angles, and steel angles over openings. Install flashings under weep hole courses and as indicated.
- .2 In cavity walls and veneered walls, carry flashings from front edge of masonry, under outer wythe, then up backing not less than 300 mm, and as follows:
  - .1 For masonry backing embed flashing 25 mm in joint.
  - .2 For concrete backing, insert flashing into reglets.
  - .3 For wood frame backing, staple flashing to walls behind sheathing paper.
  - .4 For gypsum board backing, bond to wall using manufacturer's recommended adhesive.
- .3 Lap joints 150 mm and seal with adhesive.
- .2 Form flashing (end dams) at lintels, sills and wall ends to prevent water from travelling horizontally past flashing ends.

### **3.4 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

**CONCRETE UNIT MASONRY**

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**Part 1 GENERAL**

**1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 04 05 00 - Common Work Results for Masonry.
- .3 Section 04 05 12 - Masonry Mortar and Grout.
- .4 Section 04 05 19 - Masonry Anchorage and Reinforcing.
- .5 Section 04 05 23 - Masonry Accessories.

**1.2 REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM E514, Standard Test Method for Water Permeance of Masonry.
  - .2 ASTM E96, Standard Test Methods for Water Vapour Transmission of Materials.
- .2 Canadian Standards Association (CSA)
  - .1 CAN/CSA A165 SERIES, CSA Standards on Concrete Masonry Units, covers: A165.1, A165.2, A165.3.
  - .2 CAN/CSA A371, Masonry Construction for Buildings.
  - .3 CSA S304.1, Design of Masonry Structures.
- .3 Underwriters' Laboratories of Canada (ULC).
  - .1 CAN/ULC-S101, Standard Methods of Fire Endurance Tests of Building Construction and Materials.

**1.3 SUBMITTALS**

- .1 Product Data
  - .1 Submit manufacturer's printed product Literature, specifications and data sheet illustrating products to be incorporated into project for specified products.
- .2 Samples
  - .1 Two of each type of concrete masonry unit specified.
- .3 Manufacturer's Instructions
  - .1 Submit manufacturer's installation instructions.



**CONCRETE UNIT MASONRY**

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.4 Certificates

- .1 Submit a certification report stating the concrete masonry unit manufacturer is in compliance with the performance and certification criteria for manufactured water-repellent concrete masonry units. Certification report to include:
  - .1 Test method results.
  - .2 Masonry unit physical properties.
  - .3 Manufacturer's certificate of performance.

**1.4 QUALITY ASSURANCE**

.1 Mock-up

- .1 Construct mock-up in accordance with Section 01 45 00 – Quality Control.
- .2 Construct mock-up 10 m<sup>2</sup> minimum of brick unit masonry in area designated by Owner before proceeding with brick unit masonry work.
- .3 Allow two (2) working days for inspection of mock-up by Owner before proceeding with Concrete Unit Masonry Work.

.2 Test reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.4 Pre-installation meeting: conduct pre-installation meeting to verify project requirements manufacturer's instructions and manufacturer's warranty requirements.

**1.5 QUALIFICATIONS**

.1 Manufacturer: company specializing in manufacturing products of this section with minimum 10 years experience.

- .1 Hold a current certification in the manufacture of water-repellent concrete masonry units.

.2 Installer: company specializing in performing work of this section approved by manufacturer. Minimum 5 years experience.

.3 Design structural installations under direct supervision of Professional Engineer experienced in structural design of concrete masonry installation and registered in the Province of Newfoundland and Labrador.

**CONCRETE UNIT MASONRY**

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**1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
  - .1 Offload concrete unit masonry packages using equipment that will not damage the surfaces.
  - .2 Do not use brick tongs to move or handle masonry.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Do not double stack cubes of concrete unit masonry.
  - .3 Cover masonry units with non-staining waterproof membrane covering.
  - .4 Allow air circulation around units.
  - .5 Installation of wet or stained masonry units is prohibited.
  - .6 Keep concrete unit masonry in individual cardboard packaging provided by manufacturer until units are ready to be installed.
  - .7 Store and protect concrete unit masonry from nicks, scratched, and blemishes.
  - .8 Replace defective or damaged materials with new.

**Part 2 PRODUCTS**

**2.1 MATERIALS**

- .1 Standard concrete block units: to CAN/CSA-A165, Series (CAN/CSA-A165.1)
  - .1 Classification: H/10/A/M
  - .2 Size: modular.
  - .3 Special shapes: provide bull nosed units for exposed corners. Provide purpose-made shapes for lintels and bond beams. Provide additional special shapes as indicated.
- .2 Split-face concrete block units Type 1: to CAN/CSA-A165 Series-04 (CSA-A165.1).  
Decorative face treatment: split face ashlar/centre scored.
  - .1 Classification: S/20/A/M.
  - .2 Size: modular as indicated on drawings.
  - .3 Special shapes: provide square units for exposed corners. Provide purpose-made shapes for lintels and bond beams. Provide additional special shapes as indicated.

## CONCRETE UNIT MASONRY

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- .4 Colour: as selected by Owner from manufacturer's standard colour range.
- .3 Acoustical concrete block units: to CAN/CSA-A165 Series [CAN/CSA-A165.1] purpose made with slots to provide the acoustical characteristics specified.
  - .1 Classification: H/10/C/M
  - .2 Size: modular
  - .3 Special shapes: provide special shapes indicated. Provide purpose made shapes for lintels and bond beams.

### 2.2 WATER-REPELLENT ADMIXTURE

- .1 Liquid, polymeric based water-repellent admixture to ASTM E514, incorporated into the concrete mix at block plant during the concrete masonry unit manufacturing process.
  - .1 Water-repellent admixture to be incorporated into concrete mix at the water-repellent manufacturer's recommended dosage.

### 2.3 ACCESSORIES

- .1 Reinforcement: to Section 04 05 19 - Masonry Anchorage and Reinforcing.
- .2 Connectors: to Section 04 05 19 - Masonry Anchorage and Reinforcing.
- .3 Flashing: to Section 04 05 23 - Masonry Accessories.
- .4 Mortar and mortar mixes: to Section 04 05 12 - Masonry Mortar and Grout.
- .5 Grout and grout mixes: to Section 04 05 12 - Masonry Mortar and Grout.

### 2.4 CLEANING COMPOUNDS

- .1 Use VOC products to limits listed in Section 01 35 21 - LEED® Requirements.
- .2 Compatible with substrate and acceptable to masonry manufacturer for use on products.
- .3 Cleaning compounds compatible with concrete unit masonry and in accordance with manufacturer's written recommendations and instructions.

### 2.5 TOLERANCES

- .1 Tolerances for standard concrete unit masonry tolerances in accordance with CAN/CSA A165.1, supplemented as follows:
  - .1 Maximum variation between units within specific job lot not to exceed 2.0 mm.

**CONCRETE UNIT MASONRY**

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- .2 No parallel edge length, width or height dimension for individual unit to differ by more than 2.0 mm.
- .3 Out of square tolerance not to exceed 2.0 mm.

**Part 3      EXECUTION**

**3.1          INSTALLATION**

- .1 Concrete block units.
  - .1 Bond: running
  - .2 Coursing height: 200 mm for one block and one joint
  - .3 Jointing: concave where exposed or where paint or other finish coating is specified
- .2 Special Shapes:
  - .1 Install special units to form corners, returns, offsets, reveals and indents without cut ends being exposed and without losing bond or module.
  - .2 Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated.
  - .3 End bearing: not less than 200 mm.
- .3 Acoustical Concrete Unit Masonry:
  - .1 Bond: running.
  - .2 Coursing height: 200 mm for one block and one joint.
  - .3 Jointing: concave where exposed or where paint or finish coating is specified.

**3.2          CONSTRUCTION**

- .1 Installer shall use only masonry units containing a compatible integral water-repellent admixture added to the concrete masonry units (CMU) at the time of manufacture for construction of water-repellent masonry walls.
- .2 Installer shall use only mortar containing integral liquid polymeric water-repellent admixture at the manufacturer's recommended addition rate and mixed according to the manufacturer's recommended instructions for construction of water-repellent masonry walls.
- .3 Installing Units: Use face bedding to provide the greatest resistance to water penetration.
- .4 Cull out masonry units, in accordance with CAN/CSA A165 and approved range of color samples, with chips, cracks, broken corners, excessive color and texture variation.

## CONCRETE UNIT MASONRY

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- .5 Build in miscellaneous items such as bearing plates, steel angles, bolts, anchors, inserts, sleeves and conduits.
- .6 Construct masonry walls using running bond unless otherwise noted.
- .7 Fit masonry closely against electrical and plumbing outlets so collars, plates and covers overlap and conceal cuts.
- .8 Install movement joints and keep free of mortar where indicated.
- .9 Hollow Units: spread mortar setting bed from outside edge of face shells. Gauge amount of mortar on top and end of unit to create full joints, equivalent to shell thickness. Avoid excess mortar.
- .10 Solid Units: apply mortar over entire vertical and horizontal surfaces. Avoid bridging of airspace between brick veneer and backup wall with mortar.
- .11 Ensure compacted head joints. Use full or face-shell joint as indicated.
- .12 Tamp units firmly into place.
- .13 Do not adjust masonry units after mortar has set. Where resetting of masonry is required, remove, clean and reset units in new mortar.
- .14 Tool exposed joints concave; strike concealed joints flush.
- .15 After mortar has achieved initial set up, tool joints.
- .16 Do not interrupt bond below or above openings.

### 3.3 CLEANING

- .1 Promptly remove excess wet mortar containing integral water-repellent mortar admixture from face of masonry as work progresses by dry brushing.
- .2 Clean masonry once mortar is set and cured.
- .3 Upon completion of installation remove surplus materials, rubbish, tools and equipment barriers.

### 3.4 PROTECTION

- .1 Brace and protect concrete unit masonry in accordance with Section 04 05 00 - Common Work Results for Masonry.
- .2 Cover top of unfinished masonry work to protect it from the weather and to prevent accumulation of water in CMU cores.

**CONCRETE UNIT MASONRY**

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END OF SECTION

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## **METAL FABRICATIONS**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Shop fabricated ferrous metal and aluminum items.

#### **1.3 RELATED SECTIONS**

- .1 Division 03 Section Cast-in-place Concrete: Placement of metal fabrications in concrete.
- .2 Division 07 Section Sheet Metal Flashing and Trim: Fabrication requirements and installation of exterior canopy downpipe system.
- .3 Division 09 Section Painting: Finish paint.
- .4 Division 26 Section Photovoltaic Collectors: Fabrication requirements and installation of photovoltaic collectors on roof.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Coordinate with other work having a direct bearing on work of this section.
  - .1 Coordinate the Work with installation of adjacent components or materials.
  - .2 Coordinate installation of anchorages for metal fabrications.
  - .3 Coordinate selection of shop primers with topcoats to be applied over them.

#### **1.5 PERFORMANCE REQUIREMENTS**

- .1 Design the following and similar items required to withstand loads and the effects of earthquake motions, including comprehensive engineering analysis by a professional engineer, using performance requirements and design criteria specified or indicated, and as required by applicable code.
  - .1 Ladders.
  - .2 Lintels.
  - .3 Structural steel fascias and feature trim.
  - .4 Structural framing and supports for partition systems.
  - .5 Supports for photovoltaic collectors.



## **METAL FABRICATIONS**

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### **1.6 .6 Miscellaneous framing and supports. SUBMITTALS FOR REVIEW**

#### **.1 LEED Submittals:**

##### **.1 Product Data:**

- .1 Credit MR 4:** For products required to have recycled content.

#### **.2 Shop Drawings:**

- .1** Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
- .2** Indicate welded connections using standard welding symbols. Indicate net weld lengths.
- .3** For items specified to conform to structural performance requirements, prepare Shop Drawings under direct supervision of a professional engineer responsible for their preparation.
  - .1** Include component structural and physical characteristics, calculations, dimensional limitations.
  - .2** Each shop drawing to bear seal and signature of the professional engineer.

### **1.7 SUBMITTALS FOR INFORMATION**

- .1** Qualifications Data: For fabricator and professional engineer.
- .2** Welders' Certificates: Certifying welders employed on the Work, verifying qualification within the previous 12 months to CSA W47 series, CSA W55.3, CSA W59, and CSA W59.2.
- .3** Product Test Reports: For railings, for tests performed by a qualified testing agency, according to ASTM E894 and ASTM E935.
- .4** Field quality control reports.

### **1.8 QUALITY ASSURANCE**

- .1** Fabricator Qualifications: Company specializing in performing the work of this section with minimum five documented experience.
- .2** Installer Qualifications: Fabricator.
- .3** Professional Engineer's Qualifications: Structural engineer experienced in design and installation of the work indicated, and licensed in the Province where the Project is located.

## METAL FABRICATIONS

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- .4 Welded Steel Construction: CSA-W59.
- .5 Welded Aluminum Construction: CSA-W59.2.

### Part 2 Products

#### 2.1 MATERIALS - GENERAL

- .1 Minimum Recycled Content: Provide steel materials with recycled content in conformance with Credit MR 4.

#### 2.2 MATERIALS

- .1 Steel Sections and Plates: CAN/CSA-G40.20/G40.21, Grade 300W.
- .2 Steel Pipe: ASTM A53/A53M, Grade B, Schedule 40.
- .3 Steel Tubing: ASTM A500, Grade B.
- .4 Stainless Steel Sheet: ASTM A240M or ASTM A666, Type 304.
- .5 Stainless Steel Tubing: ASTM A554, Grade MT, seamless welded.
- .6 Aluminum Sections:
  - .1 Bars and Tubing: ASTM B221, alloy 6063-T5/T52.
  - .2 Extruded Structural Pipe and Round Tubing: ASTM B 429/B 429M, Alloy 6063-T6.
  - .3 Drawn Seamless Tubing: ASTM B 210, alloy 6063-T832.
- .7 Plate and Sheet: ASTM B 209 (ASTM B 209M), alloy 6061-T6.
- .8 Aluminum Rolled Tread Plate: ASTM B632, alloy 6061-T6.
- .9 Gratings for Soffits: NAAMM MBG 531.
  - .1 Steel, welded, Type W-19-4, galvanized.
  - .2 Rectangular Bearing Bars: 25 x 3 mm spaced 30.16 mm on centre.
  - .3 Cross Bars: 100 mm on centre.
  - .4 Surface: Plain (not serrated).
  - .5 Finish galvanized.
- .10 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; consistent with design of fabricated item, of type compatible with material being fastened, corrosion resistant, strength and size to suit application. Wood plugs not permitted.
- .11 Bolts, Nuts, and Washers: ASTM A307, galvanized to ASTM A153/A153M for galvanized components.
- .12 Expansion Anchors: Anchor bolt and sleeve assembly capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and

## METAL FABRICATIONS

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equal to 4 times the load imposed when installed in concrete per ASTM E488.

- .1 Material or Interior Locations except where Stainless Steel is Indicated: Carbon steel components zinc-plated to conform to ASTM B633, Class Fe/Zn 5.
- .2 Stainless Steel: Bolts and nuts conforming to ASTM F593 and ASTM F594, and as follows, unless otherwise specified.
  - .1 Alloy 316 for exterior locations.
  - .2 Alloy 304 for interior locations.
- .13 Welding Materials: Type required for materials being welded.
- .14 Welding Filler Material: CSA-W48.
- .15 Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.
- .16 Touch-Up Primer for Galvanized Surfaces: SPCC-Paint 20, Type II Organic zinc rich.
- .17 Isolating Tape: Butyl, extruded, macro-polyisobutylene type, size and hardness to suit application.
- .18 Grout: Prebagged, non-shrink, non-metallic, flowable, minimum 15 MPa compressive strength, 7.9 MPa pull-out strength. Sika Grout 212 by Sika Canada, or approved equivalent.

### 2.3 FABRICATION

- .1 General: Fabricate items to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- .2 Fit and shop assemble items in largest practical sections, for delivery to site.
- .3 Fabricate items with joints tightly fitted and secured.
- .4 Cut, drill, and punch metals cleanly and accurately.
- .5 Continuously seal joined members by intermittent welds and plastic filler in concealed locations; provide continuous welds in exposed locations.
- .6 Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- .7 Finish exposed metal sheet surfaces to smooth, sharp, well-defined lines and arise. Produce flat, flush surfaces without cracking or grain separation at bends. Remove burrs and ease edges.
- .8 Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- .9 Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## METAL FABRICATIONS

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### 2.4 FABRICATION TOLERANCES

- .1 Squareness: 3 mm maximum difference in diagonal measurements.
- .2 Maximum Offset between Faces: 1.6 mm.
- .3 Maximum Misalignment of Adjacent Members: 1.6 mm.
- .4 Maximum Bow: 3 mm in 1.2 m.
- .5 Maximum Deviation from Plane: 1.6 mm in 1.2 m.

### 2.5 FINISHES

- .1 Steel:
  - .1 General:
    - .1 Galvanize exterior steel items, unless otherwise specified.
    - .2 Prime paint interior steel items, unless otherwise specified.
  - .2 Prime Painting:
    - .1 Prepare surfaces to be primed in accordance with SSPC SP 2.
    - .2 Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
    - .3 Do not prime surfaces in direct contact with concrete or where field welding is required.
    - .4 Prime paint items with two coats.
  - .3 Galvanizing:
    - .1 Structural Steel Items: ASTM A123/A123M, minimum 600 g/sq m galvanized coating.
    - .2 Non-structural Items: ASTM A123/A123M, minimum 380 g/sq m galvanized coating.
    - .3 Bolts, Nuts, and Washers: ASTM A153/A153M.
  - .4 Prepare surfaces for finish painting where indicated to receive finish paint specified in Division 09 Section Painting.
- .2 Aluminum:
  - .1 Mill finish items, unless otherwise indicated or specified.
  - .2 Baked-Enamel Finish: AAMA 2603 except with a minimum dry film thickness of 0.04 mm. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
    - .1 Color and Gloss: PPG 'Duramar Sunstorm' – Cosmic Gray Mica
  - .3 Corrosion Protection: Coat concealed surfaces of aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
    - .1 Extruded Aluminum: Two coats of clear lacquer.
    - .2 Cast Aluminum: Heavy coat of bituminous paint.
- .3 Stainless Steel: AISI No. 4 satin (brushed) finish, unless otherwise indicated or specified.

## **METAL FABRICATIONS**

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### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- .2 Verify that field conditions are acceptable and are ready to receive work.
- .3 Verify dimensions, tolerances, and method of attachment with other work.
- .4 Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- .1 Clean and strip primed steel items to bare metal where site welding is required.
- .2 Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

#### **3.3 INSTALLATION**

- .1 Install items plumb and level, accurately fitted, free from distortion or defects, in accordance with shop drawings.
- .2 Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- .3 Field weld components indicated on Shop Drawings.
- .4 Railings:
  - .1 Secure railings to structure.
  - .2 Anchor railing posts to structure with anchor plates and anchors.
- .5 Perform field welding to CSA requirements.
- .6 Obtain approval prior to site cutting or making adjustments not scheduled.

#### **3.4 ERECTION TOLERANCES**

- .1 Maximum Variation from Plumb: 6 mm per storey, non-cumulative.
- .2 Maximum Offset from True Alignment: 6 mm.

## **METAL FABRICATIONS**

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- .3 Maximum Out-of-Position: 6 mm.

### **3.5 ADJUSTING AND CLEANING**

- .1 After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- .2 Clean prefinished aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.
- .3 Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
- .4 Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780/A780M.

### **3.6 PROTECTION OF FINISHED WORK**

- .1 Protect finished work from damage during construction period with temporary protective coverings approved by fabricator or manufacturer. Remove protective coverings at time of Substantial Performance.

### **3.7 SCHEDULE**

- .1 The following Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled. Unless otherwise indicated on drawing details provide items specified.
- .2 Ladders: Conform to ANSI A14.3 unless otherwise specified.
  - .1 Vertical Ladders: Steel, of 9 x 64 mm side rails spaced at 400 mm; rungs of 25 mm diameter solid rod plug welded to rails, spaced 300 mm on centre; space rungs 200 mm from wall surface; with steel mounting brackets and attachments welded to rails at 1500 mm on centre; prime paint finish.
- .3 Corner Guards for Gypsum Board: Stainless steel bent plate, 50 x 50 x 2.78 mm thick x 1500 mm high, surface mounting application. Drill and countersink holes at 375 mm on centre for flathead stainless steel screws; No 4, brushed finish.
- .4 Pipe Guards: Steel plate, 9 mm thick by 300 mm wide, bent to fit flat against the wall or column at both ends and to fit around pipe; 50 mm clearance between pipe and pipe guard. Drill each end for two 19 mm anchor bolts. Galvanized finish.

## METAL FABRICATIONS

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- .5 Bollards: Steel pipe, 8.2 mm wall thickness x 150 mm diameter, 1350 mm height above grade, unless otherwise indicated. Extend pipe minimum 900 mm below grade or floor, concrete filled, crowned cap, prime paint finish.
- .6 Lintels: Steel angles and plates; 200 mm end bearings. Weld back-to-back angles. Prime paint interior items; galvanize exterior items. Use steel lintels for concrete unit masonry where reinforced unit masonry lintels are not specified or indicated. Unless otherwise indicated, provide the following sizes:
  - .1 At 100 mm thick brick masonry openings up to 2400 mm use 90 x 90 x 6 mm angle; in 2440 to 2660 mm openings use 100 x 90 x 6 mm angle; in 2660 to 3310 mm openings use 125 x 90 x 8 mm angle; in 3310 to 3480 mm openings use 125 x 90 x 10 mm angle.
  - .2 At concrete unit masonry openings of 1370 to 1800 mm use two 90 x 65 x 6 mm angles in 140 mm wall thickness; two 90 x 75 x 6 mm angles in 190 mm wall thickness.
  - .3 At concrete unit masonry openings of 1800 to 2400 mm use two 90 x 65 x 6 mm angles with 150 x 10 mm plate in 140 mm wall thickness; two 100 x 75 x 6 mm angles with 150 x 10 mm plate in 190 mm wall thickness.
  - .4 At concrete unit masonry openings of 2400 to 4000 mm use two 90 x 65 x 8 mm angles with 190 x 12 mm plate in 140 mm wall thickness; two 100 x 90 x 8 mm angles with 190 x 12 mm plate in 190 mm wall thickness.
- .7 Floor Access Covers and Frames in Floors with Applied Finishes:
  - .1 Aluminum, welded construction.
  - .2 Pan: Plate, 3 mm thickness, depth suitable to receive floor finish and setting material. Floor finish in pan flush with frame.
  - .3 Frame: Angle, 55 x 55 x 6 mm thickness, with continuous vinyl gasket. Provide hooked bar anchors, minimum one each side and spaced 900 mm maximum for setting into concrete. Tack weld expanded metal mesh to entire pan.
  - .4 Provide concealed locking device accessible through hole with removable plug cover.
  - .5 Set frame flush with floor surface
- .8 Structural Steel Fascias and Feature Trim:
  - .1 Fabricate items from steel shapes or plates of profiles indicated with continuously welded joints and smooth exposed edges. Mitre corners and use concealed field splices where possible.
  - .2 Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
  - .3 Provide bolts and anchors of appearance and location acceptable to Consultant.
  - .4 Galvanized finish.

## **METAL FABRICATIONS**

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- .9 Exposed Bolt Connections: Designs, locations and types of nuts, washers, exposed threads to be selected by Consultant. Coordinate anchor sizes and spacings with Division 05 Section Structural Steel.
- .10 Supports for Photovoltaic Collectors:
  - .1 Fabricate supports from aluminum tubing with anchor plates, welded construction. Fabricate to sizes and profiles indicated to receive collector assemblies.
  - .2 Design tube supports for anchoring to roof structure and collector assemblies, and to receive standard-sized roof penetration flashings.
  - .3 Include brackets, clips, anchors and fasteners for installation.
  - .4 Finish: Mill finish.
- .11 Miscellaneous Framing and Supports:
  - .1 General: Provide steel framing and supports not specified in other Sections as needed to complete the Work, including:
    - .1 Framing and supports for mechanical and electrical equipment.
    - .2 Exposed or concealed suspending structures for interior storefronts and partitions.
    - .3 Framing and supports for folding doors and grilles.
    - .4 Roof and floor opening frames.
    - .5 Anchor plates and angles concealed in hollow walls to support wall-mounted items.
    - .6 Anchor plates cast-in, built into or attached to solid walls, for supporting other work. Include anchor plates for connecting elevator guide rails to structure.
  - .2 Fabricate items from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
    - .1 Include brackets, clips, anchors and fasteners for installation.
    - .3 Furnish inserts for items installed after concrete is placed.
    - .4 Finishes: Prime paint interior items; galvanize exterior items.

**END OF SECTION**



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## ROUGH CARPENTRY

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### Part 1

#### 1.1 SUMMARY

##### .1 SECTION INCLUDES:

- .1 Framing with dimension lumber.
- .2 Framing with timber.
- .3 Framing with engineered wood products.
  - .1 Open-web trusses.
  - .2 Laminated-veneer lumber.
  - .3 Parallel-strand lumber.
  - .4 Wood I-joists.
  - .5 Rim boards.
- .4 Shear wall panels.
- .5 Rooftop equipment bases and support curbs.
- .6 Wood blocking[, cants,] and nailers.
- .7 Wood furring[ and grounds].
- .8 Wood sleepers.
- .9 Utility shelving.
- .10 Plywood backing panels.

##### .2 RELATED REQUIREMENTS:

- .1 Section 061063 "Exterior Rough Carpentry."
- .2 Section 061300 "Heavy Timber Construction."
- .3 Section 061533 "Wood Patio Decking" for elevated decks, including support framing.
- .4 Section 061600 "Sheathing" for sheathing, subflooring, and underlayment.

## ROUGH CARPENTRY

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- .5 Section 061753 "Shop-Fabricated Wood Trusses" for wood trusses made from dimension lumber.
- .6 Section 064013 "Exterior Architectural Woodwork" for exterior wood stairs and railings.
- .7 Section 064023 "Interior Architectural Woodwork" for interior wood stairs and railings.
- .8 Section 313116 "Termite Control" for site application of borate treatment to wood framing.

### 1.2 DEFINITIONS

- .1 Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- .2 Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.
- .3 Exposed Framing: Framing not concealed by other construction.
- .4 OSB: Oriented strand board.
- .5 Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.
- .6 Lumber grading agencies, and abbreviations used to reference them, include the following:
  - .1 NeLMA: Northeastern Lumber Manufacturers' Association.
  - .2 NLGA: National Lumber Grades Authority.
  - .3 SPIB: The Southern Pine Inspection Bureau.
  - .4 WCLIB: West Coast Lumber Inspection Bureau.
  - .5 WWPA: Western Wood Products Association.

### 1.3 ACTION SUBMITTALS

- .1 Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - .1 Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

## ROUGH CARPENTRY

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- .2 Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
  - .3 For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency in accordance with ASTM D5664.
  - .4 For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
- .2 Shop Drawings: Show fabrication and installation details for open-web trusses.
- .1 Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
  - .2 Indicate sizes, stress grades, and species of lumber.
  - .3 Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
  - .4 Indicate locations, sizes, and materials for permanent bracing required to prevent buckling of individual truss members due to design loads.
- .3 Delegated Design Submittal: For open-web trusses indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- .4 Sustainable Design Submittals:
- .1 Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
  - .2 Product Certificates: For regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project and cost for each regional material.
  - .3 Environmental Product Declaration (EPD): For each product.
  - .4 Health Product Declaration (HPD): For each product.
  - .5 Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

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- .6 Product Certificates: For indigenous materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project, means of transportation, and cost for each indigenous material.
- .7 Environmental Product Declaration (EPD): For each product.
- .8 Product Certificates: For regional materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project, means of transportation, and cost for each regional material.
- .9 Environmental Product Declaration (EPD): For each product.
- .10 Environmental Product Declaration (EPD): For each product.
- .11 Third-Party Certifications: For each product.
- .12 Third-Party Certified Life Cycle Assessment: For each product.
- .13 Chain-of-Custody Certificates: For certified wood products. Include statement of costs.
- .14 Chain-of-Custody Qualification Data: For manufacturer and vendor.
- .15 Product Data: For composite wood products, indicating that product contains no urea formaldehyde.
- .16 Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.
- .17 Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.
- .18 Product Data: For composite wood products, indicating compliance with requirements for formaldehyde emissions.
- .19 Product Data: For composite wood products, indicating that product contains no urea formaldehyde.
- .20 Product Data: For installation adhesives, indicating VOC content.
- .21 Laboratory Test Reports: For installation adhesives, indicating compliance with requirements for low-emitting materials.

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### 1.4 INFORMATIONAL SUBMITTALS

- .1 Qualification Data Coordinate with qualification requirements in Section 014000 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article. Qualification Data: For [open-web truss manufacturer] [and] [professional engineer].
- .2 Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- .3 Reports: For the following, from ICC-ES:
  - .1 Wood-preservative-treated wood.
  - .2 Fire-retardant-treated wood.
  - .3 Engineered wood products.
  - .4 Shear panels.
  - .5 Power-driven fasteners.
  - .6 Post-installed anchors.
  - .7 Metal framing anchors.
  - .8 Sill sealer gasket/termite barrier.
- .4 Qualification Statements: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

### 1.5 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

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- .2 Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.
- .3 Manufacturer Qualifications for Open-Web Trusses:
  - .1 Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
  - .2 Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

### 1.6 DELIVERY, STORAGE AND HANDLING

- .1 Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

## Part 2 PRODUCTS

### 2.1 WOOD PRODUCTS, GENERAL

- .1 Regional Materials: The following wood products to be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
  - .1 Dimension lumber[, **except treated materials**].
  - .2 Open-web trusses.
  - .3 Laminated-veneer lumber.
  - .4 Parallel-strand lumber.
  - .5 Prefabricated wood I-joists.
  - .6 Rim boards.
- .2 Regional Materials: The following wood products to be manufactured within 500 miles (800 km) of Project site.

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- .1 Dimension lumber[, **except treated materials**].
  - .2 Open-web trusses.
  - .3 Laminated-veneer lumber.
  - .4 Parallel-strand lumber.
  - .5 Prefabricated wood I-joists.
  - .6 Rim boards.
- .3 Regional Materials: The following wood products to be manufactured within 100 miles (160 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles (160 km) of Project site.
- .1 Dimension lumber[, **except treated materials**].
  - .2 Open-web trusses.
  - .3 Laminated-veneer lumber.
  - .4 Parallel-strand lumber.
  - .5 Prefabricated wood I-joists.
  - .6 Rim boards.
- .4 Indigenous Materials: The following wood products to be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site. If materials are transported by rail or water, the distance transported by rail or water to be multiplied by 0.25 to determine the distance to Project site.
- .1 Dimension lumber[, **except treated materials**].
  - .2 Open-web trusses.
  - .3 Laminated-veneer lumber.
  - .4 Parallel-strand lumber.
  - .5 Prefabricated wood I-joists.



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- .6 Rim boards.
- .5 Regional Materials: The following wood products to be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site. If materials are transported by rail or water, the distance transported by rail or water to be multiplied by 0.25 to determine the distance to Project site.
  - .1 Dimension lumber[, **except treated materials**].
  - .2 Open-web trusses.
  - .3 Laminated-veneer lumber.
  - .4 Parallel-strand lumber.
  - .5 Prefabricated wood I-joists.
  - .6 Rim boards.
- .6 Certified Wood: The following wood products to be certified as "FSC Pure"[ or "FSC Mixed Credit"] in accordance with FSC STD-01-00 and FSC STD-40-004.
  - .1 Dimension lumber[, **except treated materials**].
  - .2 Open-web trusses.
  - .3 Laminated-veneer lumber.
  - .4 Parallel-strand lumber.
  - .5 Prefabricated wood I-joists.
  - .6 Rim boards.
- .7 Certified Wood: The following wood products to be certified as "FSC Pure"[ or "FSC Mixed Credit"] in accordance with FSC STD-01-001 and FSC STD-40-004.
  - .1 Dimension lumber[, **except treated materials**].
  - .2 Open-web trusses.

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- .3 Laminated-veneer lumber.
- .4 Parallel-strand lumber.
- .5 Prefabricated wood I-joists.
- .6 Rim boards.
- .8 Certified Wood: The following wood products to be labeled in accordance with the AF&PA's Sustainable Forestry Initiative, be certified as "FSC Pure" in accordance with FSC STD-01-001 and FSC STD-40-004, or be certified and labeled in accordance with the standards of the Programme for Endorsement of Forest Certification.
  - .1 Dimension lumber[, **except treated materials**].
  - .2 Open-web trusses.
  - .3 Laminated-veneer lumber.
  - .4 Parallel-strand lumber.
  - .5 Prefabricated wood I-joists.
  - .6 Rim boards.
- .9 Certified Wood: The following wood products to [contain not less than 60 percent] [be made from] certified wood tracked through a chain-of-custody process. Certified wood documentation to be provided by sources certified through a forest certification system with principles, criteria, and standards developed using ISO/IEC Guide 59 or the World Trade Organization's "WTO Agreement on Technical Barriers to Trade."
  - .1 Dimension lumber[, **except treated materials**].
  - .2 Open-trusses trusses.
  - .3 Laminated-veneer lumber.
  - .4 Parallel-strand lumber.
  - .5 Prefabricated wood I-joists.
  - .6 Rim boards.

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- .10 Certified Wood: The following wood products to be certified in accordance with the American Tree Farm System's "AFF Standard," the AF&PA's Sustainable Forestry Initiative, FSC STD-01-001 and FSC STD-40-004, or the standards of the Programme for Endorsement of Forest Certification.
- .1 Dimension lumber[, **except treated materials**].
  - .2 Open-web trusses.
  - .3 Laminated-veneer lumber.
  - .4 Parallel-strand lumber.
  - .5 Prefabricated wood I-joists.
  - .6 Rim boards.
- .11 Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
- .1 Factory mark each piece of lumber with grade stamp of grading agency.
  - .2 For exposed lumber indicated to receive a stained or natural finish, [**mark grade stamp on end or back of each piece**] [**or**] [**omit grade stamp and provide certificates of grade compliance issued by grading agency**].
  - .3 Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
  - .4 Dress lumber, S4S, unless otherwise indicated.
- .12 Maximum Moisture Content of Lumber:
- .1 Boards: [**15**] [**19**] percent.
  - .2 Dimension Lumber: [**15 percent**] [**19 percent**] [**15 percent for 2-inch nominal (38-mm actual) thickness or less; 19 percent for more than 2-inch nominal (38-mm actual) thickness**] [**15 percent for 2-inch nominal (38-mm actual) thickness or less; no limit for more than 2-inch nominal (38-mm actual) thickness**] [**19 percent for 2-inch nominal (38-mm actual) thickness or**

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less; no limit for more than 2-inch nominal (38-mm actual) thickness] unless otherwise indicated.

.3 Timber. [19 percent] [No limit].

.13 Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

.1 Allowable design stresses, as published by manufacturer, to meet or exceed those indicated. Manufacturer's published values to be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

.2 Open-web trusses to be proven by testing and evaluation in accordance with ICC AC 306 "Acceptance Criteria for Pin-Connected Open-Web Trusses with Wood Chords and Tubular Steel Webs."

.1Roof Trusses: Vertical deflection of [1/180] [1/240] [1/360] ←Insert value→ of span.

.2Floor Trusses: Vertical deflection of [1/360] [1/480] [1/600] ←Insert value→ of span.

## 2.2 PRESERVATIVE TREATMENT

.1 Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2[ for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground].

.1 Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.[ Do not use inorganic boron (SBX) for sill plates.]

.2 For exposed items indicated to receive a stained or natural finish, chemical formulations will not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

.3 After treatment, redry [boards] [dimension lumber] to 19 percent maximum moisture content.

.2 Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

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- .3 Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
  - .1 For exposed lumber indicated to receive a stained or natural finish, [mark end or back of each piece] [or] [omit marking and provide certificates of treatment compliance issued by inspection agency].
- .4 Application: Treat [all rough carpentry unless otherwise indicated.] [items indicated on Drawings, and the following:]
  - .1 Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  - .2 Wood sills, sleepers, blocking, [furring,] [stripping,] and similar concealed members in contact with masonry or concrete.
  - .3 Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
  - .4 Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
  - .5 Wood floor plates that are installed over concrete slabs-on-grade.
  - .6 ←Insert item→.

## 2.3 FIRE-RETARDANT TREATMENT

- .1 General: Where fire-retardant-treated materials are indicated, materials to comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- .2 Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 ft. (3.2 m) beyond the centerline of the burners at any time during the test.
  - .1 Treatment will not promote corrosion of metal fasteners.

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- .2 Exterior Type: Treated materials to comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering in accordance with ASTM D2898. Use for exterior locations and where indicated.
- .3 Interior Type A: Treated materials to have a moisture content of 28 percent or less when tested in accordance with ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
- .4 Design Value Adjustment Factors: Treated lumber to be tested in accordance with ASTM D5664 and design value adjustment factors to be calculated in accordance with ASTM D6841.[ For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.]
- .3 Kiln-dry lumber after treatment to maximum moisture content of 19 percent.[ Kiln-dry plywood after treatment to maximum moisture content of 15 percent.]
- .4 Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
  - .1 For exposed lumber indicated to receive a stained or natural finish, [mark end or back of each piece] [or] [omit marking and provide certificates of treatment compliance issued by testing agency].
- .5 For exposed items indicated to receive a stained or natural finish, chemical formulations will not bleed through, contain colorants, or otherwise adversely affect finishes.
- .6 Application: Treat [all rough carpentry unless otherwise indicated.] [items indicated on Drawings, and the following:]
  - .1 Framing for raised platforms.
  - .2 Framing for stages.
  - .3 Concealed blocking.
  - .4 Framing for non-load-bearing partitions.
  - .5 Framing for non-load-bearing exterior walls.

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- .6 Roof construction.
- .7 Plywood backing panels.
- .8 ←Insert item→.

### 2.4 DIMENSION LUMBER FRAMING

- .1 Non-Load-Bearing Interior Partitions by Grade: [Construction or No. 2] [Construction, Stud, or No. 3] [Standard, Stud, or No. 3] grade.
  - .1 Application: [All interior partitions] [Interior partitions not indicated as load bearing].
  - .2 Species:
    - .1 Hem-fir (north); NLGA.
    - .2 Southern pine or mixed southern pine; SPIB.
    - .3 Spruce-pine-fir; NLGA.
    - .4 Hem-fir; WCLIB, or WWP.
    - .5 Spruce-pine-fir (south); NeLMA, WCLIB, or WWP.
    - .6 Northern species; NLGA.
    - .7 Eastern softwoods; NeLMA.
    - .8 Western woods; WCLIB or WWP.
- .2 Load-Bearing Partitions by Grade: [No. 2] [Construction or No. 2] [Construction, Stud, or No. 3] grade.
  - .1 Application: [Exterior walls] [and] [interior load-bearing partitions].
  - .2 Species:
    - .1 Hem-fir (north); NLGA.

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- .2Southern pine; SPIB.
- .3Douglas fir-larch; WCLIB or WWPA.
- .4Southern pine or mixed southern pine; SPIB.
- .5Spruce-pine-fir; NLGA.
- .6Douglas fir-south; WWPA.
- .7Hem-fir; WCLIB or WWPA.
- .8Douglas fir-larch (north); NLGA.
- .9Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
- .3 Machine Stress-Rated (MSR) Lumber Partitions: Any species of MSR dimension lumber with a grade of not less than [2400f-2.0E] [2100f-1.8E] [1650f-1.5E] ←Insert grade→.
  - .1 Application: [Exterior walls] [and] [interior load-bearing partitions].
- .4 Load-Bearing Partitions by Performance: Any species and grade with a modulus of elasticity of at least [1,500,000 psi (10 350 MPa)] [1,300,000 psi (8970 MPa)] [1,100,000 psi (7590 MPa)] [1,000,000 psi (6900 MPa)] [900,000 psi (6210 MPa)] and an extreme fiber stress in bending of at least [1000 psi (6.9 MPa)] [850 psi (5.86 MPa)] [700 psi (4.83 MPa)] [600 psi (4.14 MPa)] [500 psi (3.45 MPa)] for 2-inch nominal (38-mm actual) thickness and 12-inch nominal (286-mm actual) width for single-member use.
  - .1 Application: [Exterior walls] [and] [interior load-bearing partitions].
- .5 Ceiling Joists: [Construction or No. 2] [Construction, Stud, or No. 3] [Standard, Stud, or No. 3] grade.
  - .1 Species:
    - .1Hem-fir (north); NLGA.
    - .2Southern pine; SPIB.
    - .3Douglas fir-larch; WCLIB or WWPA.
    - .4Douglas fir-larch (north); NLGA.
    - .5Southern pine or mixed southern pine; SPIB.



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- .6 Spruce-pine-fir; NLGA.
  - .7 Hem-fir; WCLIB or WWP.
  - .8 Douglas fir-south; WWP.
  - .9 Spruce-pine-fir (south); NeLMA, WCLIB, or WWP.
  - .10 Northern species; NLGA.
  - .11 Eastern softwoods; NeLMA.
  - .12 Western woods; WCLIB or WWP.
- .6 Joists, Rafters, and Other Framing by Grade: [Select Structural] [No. 1] [No. 2] [Construction or No. 2] [Construction, Stud, or No. 3] grade.
- .1 Species:
    - .1 Hem-fir (north); NLGA.
    - .2 Southern pine; SPIB.
    - .3 Douglas fir-larch; WCLIB or WWP.
    - .4 Southern pine or mixed southern pine; SPIB.
    - .5 Spruce-pine-fir; NLGA.
    - .6 Douglas fir-south; WWP.
    - .7 Hem-fir; WCLIB or WWP.
    - .8 Douglas fir-larch (north); NLGA.
    - .9 Spruce-pine-fir (south); NeLMA, WCLIB, or WWP.
- .7 Joists, Rafters, and Other Framing by Performance: Any species and grade with a modulus of elasticity of at least [1,500,000 psi (10 350 MPa)] [1,300,000 psi (8970 MPa)] [1,100,000 psi (7590 MPa)] [1,000,000 psi (6900 MPa)] [900,000 psi (6210 MPa)] and an extreme fiber stress in bending of at least [1000 psi (6.9 MPa)] [850 psi (5.86 MPa)] [700 psi (4.83 MPa)] [600 psi (4.14 MPa)] [500 psi (3.45 MPa)] for 2-inch nominal (38-mm actual) thickness and 12-inch nominal (286-mm actual) width for single-member use.

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- .8 Exposed Framing[ Indicated to Receive a Stained or Natural Finish]: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.
- .1 Species and Grade:
- .1As indicated above for load-bearing construction of same type.
- .2Hem-fir (north); [Select Structural] [No. 1] grade; NLGA.
- .3Southern pine; [Select Structural] [No. 1] [No. 2] grade; SPIB.
- .4Douglas fir-larch; [Select Structural] [No. 1] grade; WCLIB or WWP.
- .5Mixed southern pine; [Select Structural] [No. 1] [No. 2] grade; SPIB.
- .6Spruce-pine-fir; [Select Structural] [No. 1] grade; NLGA.
- .7Douglas fir-south; [Select Structural] [No. 1] grade; WWP.
- .8Hem-fir; [Select Structural] [No. 1] grade; WCLIB or WWP.
- .9Douglas fir-larch (north); [Select Structural] [No. 1] grade; NLGA.
- .10 Spruce-pine-fir (south); [Select Structural] [No. 1] grade; NeLMA, WCLIB, or WWP.
- .11 Eastern hemlock-balsam fir or eastern hemlock-tamarack; [Select Structural] [No. 1] grade; NeLMA.
- .12 Beech-birch-hickory; [Select Structural] [No. 1] grade; NeLMA.
- .13 Northern red oak; [Select Structural] [No. 1] grade; NeLMA.
- .14 Redwood; [Clear Heart Structural] [Clear Structural] [Select Structural] [No. 1] grade; RIS.
- .15 Mixed oak; [Select Structural] [No. 1] grade; NeLMA.
- .16 Mixed maple; [Select Structural] [No. 1] grade; NeLMA.
- .17 Western cedars; [Select Structural] [No. 1] grade; WCLIB or WWP.

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### 2.5 TIMBER FRAMING

- .1 Comply with the following requirements, in accordance with grading rules of grading agency indicated:
  - .1 Species and Grade:
    - .1 Douglas fir-larch, Douglas fir-larch (north), or Douglas fir-south; [Select Structural] [No. 1] grade; NLGA, WCLIB, or WWP.
    - .2 Eastern hemlock, eastern hemlock-tamarack, or eastern hemlock-tamarack (north); [Select Structural] [No. 1] grade; NeLMA or NLGA.
    - .3 Hem-fir or hem-fir (north); [Select Structural] [No. 1] grade; NLGA, WCLIB, or WWP.
    - .4 Mixed maple; [Select Structural] [No. 1] grade; NeLMA.
    - .5 Mixed oak; [Select Structural] [No. 1] grade; NeLMA.
    - .6 Southern pine; [Select Structural] [No. 1] grade; SPIB.
  - .2 Maximum Moisture Content: [20] [23] ←Insert number→ percent.
  - .3 Additional Restriction: Free of heart centers.

### 2.6 ENGINEERED WOOD PRODUCTS

- .1 Source Limitations: Obtain each type of engineered wood product from single source from single manufacturer.
- .2 Composite Wood Products: Products to be made without urea formaldehyde.
- .3 Composite Wood Products: Products to comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- .4 Composite Wood Products: Products to be made using ultra-low-emitting formaldehyde resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or to be made with no added formaldehyde.

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- .5 Composite Wood Products: Formaldehyde emission rates will not be greater than the following when tested in accordance with ASTM D 6007 or ASTM E 1333:
  - .1 Hardwood Plywood: 0.05 ppm.
  - .2 Particleboard: 0.09 ppm.
  - .3 MDF More Than 5/16 Inch (8 mm) Thick: 0.11 ppm.
  - .4 MDF 5/16 Inch (8 mm) or Less in Thickness: 0.13 ppm.
- .6 Composite Wood Products: Products to be made without urea formaldehyde.
- .7 Open-Web Trusses: Planar structural units consisting of metal-tube-connected members fabricated from wood top and bottom chords, cut and assembled before delivery to Project site.
  - .1 Basis-of-Design Product: Subject to compliance with requirements, provide RedBuilt, LLC; Red-[H] [L] [M] [S] [W] Series Trusses or comparable product by one of the following:
    - .1Boise Cascade Company.
    - .2Weyerhaeuser Company.
    - .3←Insert manufacturer's name→.
  - .2 Materials and Sizes: Wood chord members, tubular metal web members, connecting pins, bearing hardware, and attachments to be of materials and in sizes as required by open-web truss manufacturer to meet performance requirements.
  - .3 Identification: Each open-web truss to be identified by stamp indicating truss series, ICC-ES report number, manufacturer's name, plant number, date of fabrication, and independent inspection agency's logo.
  - .4 Fabrication: Cut open-web truss members to accurate lengths, angles, and sizes to produce close-fitting joints. Assemble truss members in design configurations indicated.
    - .1Fabricate open-web trusses within the following manufacturing tolerances:

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- .1 Length, Bearing to Bearing: Plus or minus 1/8 inch (3 mm) for trusses up to 30 ft. (9 m); plus or minus 1/4 inch (6 mm) for trusses greater than 30 ft. (9 m).
- .2 Depth: Plus or minus 1/8 inch (3 mm).
- .3 Camber: Plus or minus 1/8 inch (3 mm) for trusses up to 30 ft. (9 m); plus or minus 3/8 inch (9 mm) for trusses greater than 30 ft. to 60 ft. (9 m to 18 m); plus or minus 1/2 inch (12 mm) for trusses greater than 60 ft. to 120 ft. (18 m to 37 m).
- .5 Bracing: Provide permanent wood bracing members that comply with requirements for miscellaneous lumber as specified in this Section.
- .8 Laminated-Veneer Lumber (LVL): Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored in accordance with ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.
  - .1 Basis-of-Design Product: Subject to compliance with requirements, provide RedBuilt, LLC; 2.0E RedLam LVL or comparable product by one of the following:
    - .1Boise Cascade Company.
    - .2Pacific Woodtech Corporation.
    - .3Weyerhaeuser Company.
    - .4←Insert manufacturer's name→.
  - .2 Extreme Fiber Stress in Bending, Edgewise: [2900 psi (20.0 MPa)] [2845 psi (19.6 MPa)] ←Insert value→ for 12-inch nominal- (286-mm actual-) depth members.
  - .3 Modulus of Elasticity, Edgewise: [2,000,000 psi (13 700 MPa)] ←Insert value→.
  - .4 Horizontal Shear: [285 psi (1.97 MPa)] [190 psi (1.31 MPa)] ←Insert value→.
  - .5 Tension Parallel to Grain: [1660 psi (11.4 MPa)] ←Insert value→.
- .9 Moisture Protection:

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- .1 For western species (Douglas fir/hemlock), factory end and edge seal laminated veneer lumber with opaque moisture barrier.
  - .2 For southern and eastern species (southern yellow pine, yellow poplar), factory seal laminated veneer lumber on face, edge, and ends.
- .10 Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored in accordance with ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.
- .1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - .1Weyerhaeuser Company.
    - .2←Insert manufacturer's name→.
  - .2 Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20 MPa) for 12-inch nominal- (286-mm actual-) depth members.
  - .3 Modulus of Elasticity, Edgewise: 2,200,000 psi (15 100 MPa).
- .11 Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored in accordance with ASTM D5055.
- .1 Basis-of-Design Product: Subject to compliance with requirements, provide RedBuilt, LLC; Red-I Joists or comparable product by one of the following:
    - .1Boise Cascade Company.
    - .2Pacific Woodtech Corporation.
    - .3Weyerhaeuser Company.
    - .4←Insert manufacturer's name→.
  - .2 Web Material: Either OSB or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1.
  - .3 Structural Properties: Depths and design values not less than those indicated.

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.12 Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.

.1 Basis-of-Design Product: Subject to compliance with requirements, provide RedBuilt, LLC; Rim Boards or comparable product by one of the following:

.1 Boise Cascade Company.

.2 Pacific Woodtech Corporation.

.3 Weyerhaeuser Company.

.4 ←Insert manufacturer's name→.

.2 Material: [All-veneer product] [glued-laminated wood] [or] [product made from any combination solid lumber, wood strands, and veneers].

.3 Thickness: [1 inch (25 mm)] [1-1/8 inches (28 mm)] [1-1/4 inches (32 mm)] [1-1/2 inches (38 mm)].

.13 Insulated Rim Boards: Insulated product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research/evaluation report for I-joists.

.1 Manufacturer: Provide products by same manufacturer as I-joists.

.2 Rim Board Material: [All-veneer product] [glued-laminated wood] [or] [product made from any combination solid lumber, wood strands, and veneers].

.3 Rim Board Thickness: [1 inch (25 mm)] [1-1/8 inches (28 mm)] [1-1/4 inches (32 mm)].

.4 Insulation: 1-1/2-inch- (38-mm-) thick polyisocyanurate foam complying with ASTM C1289.

.5 Inside Facing: 7/16-inch- (11-mm-) thick OSB.

## 2.7 SHEAR WALL PANELS

.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

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- .1 MarinoWARE.
  - .2 Shear Transfer Systems.
  - .3 Simpson Strong-Tie Co., Inc.
  - .4 ←Insert manufacturer's name→.
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- .2 Wood-Framed Shear Wall Panels: Prefabricated assembly consisting of wood perimeter framing, tie downs, and Exposure I, Structural I plywood or OSB sheathing.
  - .3 Steel-Framed Shear Wall Panels: Prefabricated assembly consisting of cold-formed galvanized-steel panel, steel top and bottom plates, and wood studs.
  - .4 Allowable design loads, as published by manufacturer, to meet or exceed those [indicated] [of basis-of-design products] [of products of manufacturers listed]. Manufacturer's published values to be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

## 2.8 MISCELLANEOUS LUMBER

- .1 Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - .1 Blocking.
  - .2 Nailers.
  - .3 Rooftop equipment bases and support curbs.
  - .4 Cants.
  - .5 Furring.
  - .6 Grounds.
  - .7 Utility shelving.



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- .2 Dimension Lumber Items: [Construction or No. 2] [Standard, Stud, or No. 3] grade lumber of [any species.] [any of the following species:] [the following species:]
  - .1 Hem-fir (north); NLGA.
  - .2 Mixed southern pine or southern pine; SPIB.
  - .3 Spruce-pine-fir; NLGA.
  - .4 Hem-fir; WCLIB or WWP.
  - .5 Spruce-pine-fir (south); NeLMA, WCLIB, or WWP.
  - .6 Western woods; WCLIB or WWP.
  - .7 Northern species; NLGA.
  - .8 Eastern softwoods; NeLMA.
- .3 Utility Shelving: Lumber with [15] [19] percent maximum moisture content of [any of the following] [the following] species and grades:
  - .1 Eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; [Premium or No. 2 Common (Sterling)] [Standard or No. 3 Common] grade; NeLMA, NLGA, WCLIB, or WWP.
  - .2 Mixed southern pine or southern pine; No. [1] [2] grade; SPIB.
  - .3 Hem-fir or hem-fir (north); [Select Merchantable or No. 1 Common] [Construction or No. 2 Common] grade; NLGA, WCLIB, or WWP.
  - .4 Spruce-pine-fir (south) or spruce-pine-fir; [Select Merchantable or No. 1 Common] [Construction or No. 2 Common] grade; NeLMA, NLGA, WCLIB, or WWP.
- .4 Concealed Boards: [15] [19] percent maximum moisture content and [any of] the following species and grades:
  - .1 Mixed southern pine or southern pine; No. [2] [3] grade; SPIB.
  - .2 Hem-fir or hem-fir (north); [Construction or No. 2 Common] [Standard or No. 3 Common] grade; NLGA, WCLIB, or WWP.

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- .3 Spruce-pine-fir (south) or spruce-pine-fir; [Construction or No. 2 Common] [Standard or No. 3 Common] grade; NeLMA, NLGA, WCLIB, or WWP.
- .4 Eastern softwoods; No. [2] [3] Common grade; NeLMA.
- .5 Northern species; No. [2] [3] Common grade; NLGA.
- .6 Western woods; [Construction or No. 2 Common] [Standard or No. 3 Common] grade; WCLIB or WWP.
- .5 For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- .6 For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- .7 For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

### 2.9 PLYWOOD BACKING PANELS

- .1 Equipment Backing Panels: Plywood, DOC PS 1, [Exterior, A-C] [Exterior, C-C Plugged] [Exposure 1, C-D Plugged], [fire-retardant treated,] in thickness indicated or, if not indicated, not less than [1/2-inch (13-mm)] [3/4-inch (19-mm)] nominal thickness.

### 2.10 FASTENERS

- .1 General: Fasteners to be of size and type indicated and to comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.
  - .1 Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners[with hot-dip zinc coating complying with ASTM A153/A153M or ASTM F2329] [of Type 304 stainless steel].

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.2 For pressure-preservative-treated wood, use stainless steel fasteners.

.3 For redwood, use [brass/bronze] [stainless steel] [hot-dip galvanized-steel] fasteners.

.2Nails, Brads, and Staples: ASTM F1667.

.3Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

.4 Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on [ICC-ES AC01] [ICC-ES AC58] [ICC-ES AC193] [or] [ICC-ES AC308] as appropriate for the substrate.

### 2.12 METAL FRAMING ANCHORS

.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

.1 Cleveland Steel Specialty Co.

.2 MiTek Industries, Inc.

.3 Phoenix Metal Products, Inc.

.4 Simpson Strong-Tie Co., Inc.

.5 Tamlyn.

.6 ←Insert manufacturer's name→.

.2Allowable design loads, as published by manufacturer, to meet or exceed those [indicated] [of basis-of-design products] [of products of manufacturers listed]. Manufacturer's published values to be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors to be punched for fasteners adequate to withstand same loads as framing anchors.

.3 Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180)

.1 Use for interior locations unless otherwise indicated.

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.4 Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.

.1 Use for wood-preservative-treated lumber and where indicated.

.5 Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, [Type 304] [Type 316].

.1 Use for exterior locations and where indicated.

.6 Hangers: U-shaped joist hangers with 2-inch- (50-mm-) long seat and 1-1/4-inch- (32-mm-) wide nailing flanges full depth of joist. Nailing flanges provide lateral support at joist top chord.

.1 Thickness: [0.050 inch (1.3 mm)] [0.062 inch (1.6 mm)].

.7 Joist Hangers: U-shaped joist hangers with 2-inch- (50-mm-) long seat and 1-1/4-inch- (32-mm-) wide nailing flanges full depth of joist. Nailing flanges provide lateral support at joist top chord.

.1 Thickness: [0.050 inch (1.3 mm)] [0.062 inch (1.6 mm)].

.8 Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.

.1 Strap Width: [1-1/2 inches (38 mm)] [2 inches (50 mm)].

.2 Thickness: [0.050 inch (1.3 mm)] [0.062 inch (1.6 mm)].

.9 Bridging: Rigid, V-section, nailless type, 0.050 inch (1.3 mm) thick, length to suit joist size and spacing.

.10 Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch (25 mm) above base and with 2-inch- (50-mm-) minimum side cover, socket 0.062 inch (1.6 mm) thick, and standoff and adjustment plates 0.108 inch (2.8 mm) thick.

.11 Joist Ties: Flat straps, with holes for fasteners, for tying joists together over supports.

.1 Width: [3/4 inch (19 mm)] [1-1/4 inches (32 mm)].

.2 Thickness: [0.050 inch (1.3 mm)] [0.062 inch (1.6 mm)].

.3 Length: [16 inches (400 mm)] [24 inches (600 mm)] [As indicated].

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- .12 Rafter Tie-Downs: Bent strap tie for fastening rafters or roof trusses to wall studs below, 1-1/2 inches (38 mm) wide by 0.050 inch (1.3 mm) thick. [ Tie fastens to side of rafter or truss, face of top plates, and side of stud below.]
- .13 Rafter Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 2-1/4 inches (57 mm) wide by 0.062 inch (1.6 mm) thick. Tie fits over top of rafter or truss and fastens to both sides of rafter or truss, face of top plates, and side of stud below.
- .14 Floor-to-Floor Ties: Flat straps, with holes for fasteners, for tying upper floor wall studs to band joists and lower floor studs, 1-1/4 inches (32 mm) wide by 0.050 inch (1.3 mm) thick by 36 inches (914 mm) long.
- .15 Hold-Downs: Brackets for bolting to wall studs and securing to foundation walls with anchor bolts or to other hold-downs with threaded rods and designed with first of two bolts placed seven bolt diameters from reinforced base.
  - .1 Bolt Diameter: [5/8 inch (15.8 mm)] [3/4 inch (19 mm)].
  - .2 Width: [2-1/2 inches (64 mm)] [3-3/16 inches (81 mm)].
  - .3 Body Thickness: [0.108 inch (2.8 mm)] [0.138 inch (3.5 mm)].
  - .4 Base Reinforcement Thickness: [0.108 inch (2.8 mm)] [0.239 inch (6.1 mm)].
- .16 Wall Bracing:
  - .1 T-shaped bracing made for letting into studs in saw kerf, 1-1/8 inches (29 mm) wide by 9/16 inch (14 mm) deep by 0.034 inch (0.85 mm) thick with hemmed edges.
  - .2 Angle bracing made for letting into studs in saw kerf, 15/16 by 15/16 by 0.040 inch (24 by 24 by 1 mm) thick with hemmed edges.

## 2.12 MISCELLANEOUS MATERIALS

### .1 Sill-Sealer Gaskets:

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Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.

- .2 Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- .3 Self-adhering sheet consisting of 64mils (1.6 mm) of rubberized asphalt laminated on one side to a 4-mil- (0.10-mm-) thick, polyethylene-film reinforcement, and with release liner on adhesive side[; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction].

.2 Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, [butyl rubber] [or] red-asphalt] compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness s than 0.025 inch (0.6 mm).

.3Adhesives for Gluing [Furring] [and] [Sleepers] to Concrete or Masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.

- .1 Adhesives to have a VOC content of [70] ←Insert value→ g/L or less.
- .2 Adhesive to comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- .3 Adhesive to comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions will not exceed 9 mcg/cu. m or 7 ppb, whichever is less.
- .4 Adhesive to comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." The building concentration of formaldehyde will not exceed half of the indoor recommended exposure limit, or 33 mcg/cu. m, and that of acetaldehyde will not exceed 9 mcg/cu. m.

.4Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

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### Part 3 EXECUTION

#### 3.1 INSTALLATION, GENERAL

- .1 Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- .2 Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- .3 Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate [furring, ]nailers, blocking, [grounds, ]and similar supports to comply with requirements for attaching other construction.
- .4 Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.[ Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.]
- .5 Install shear wall panels to comply with manufacturer's written instructions.
- .6 Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- .7 Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
- .8 Install sill sealer gasket/termite barrier in accordance with manufacturer's written instructions at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.
- .9 Do not splice structural members between supports unless otherwise indicated.
- .10 Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - .1 Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.
- .11 Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
  - .1 Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

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- .2 Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal (38-mm actual) thickness.
- .3 Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.
- .4 Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 ft. (6 m) o.c.
- .12 Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- .13 Comply with AWP M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - .1 Use inorganic boron for items that are continuously protected from liquid water.
  - .2 Use copper naphthenate for items not continuously protected from liquid water.
- .14 Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- .15 Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - .1 Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  - .2 Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
  - .3 ICC-ES evaluation report for fastener.
- .16 Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- .17 For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
  - .1 Comply with [approved] [indicated] fastener patterns where applicable.[Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.]



## ROUGH CARPENTRY

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- .2 Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
- .3 Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

### 3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- .1 Install where indicated and where required for[ **screeding or**] attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- .2 Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- .3 Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

### 3.3 INSTALLATION OF WOOD FURRING

- .1 Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- .2 Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring [horizontally] [and] [vertically] at [24 inches (610 mm)] [600 mm] o.c.
- .3 Furring to Receive [Gypsum Board] [Plaster Lath]: Install 1-by-2-inch nominal- (19-by-38-mm actual-) size furring vertically at [16 inches (406 mm)] [400 mm] o.c.

### 3.4 INSTALLATION OF WALL AND PARTITION FRAMING

- .1 General: Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions[ and for load-bearing partitions where framing

## ROUGH CARPENTRY

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members bearing on partition are located directly over studs]. Fasten plates to supporting construction unless otherwise indicated.

- .1 For exterior walls, provide [2-by-6-inch nominal- (38-by-140-mm actual-)] [2-by-4-inch nominal- (38-by-89-mm actual-)] size wood studs spaced [24 inches (610 mm)] [16 inches (406 mm)] [600 mm] [400 mm] o.c. unless otherwise indicated.
  - .2 For interior partitions and walls, provide [2-by-6-inch nominal- (38-by-140-mm actual-)] [2-by-4-inch nominal- (38-by-89-mm actual-)] [2-by-3-inch nominal- (38-by-64-mm actual-)] size wood studs spaced [24 inches (610 mm)] [16 inches (406 mm)] [600 mm] [400 mm] o.c. unless otherwise indicated.
  - .3 Provide continuous horizontal blocking at midheight of partitions more than 96 inches (2438 mm) high, using members of 2-inch nominal (38-mm actual) thickness and of same width as wall or partitions.
- .2 Construct corners and intersections with three or more studs[, except that two studs may be used for interior non-load-bearing partitions].
  - .3 Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.
- .1 For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal (89-mm actual) depth for openings 48 inches (1200 mm) and less in width, 6-inch nominal (140-mm actual) depth for openings 48 to 72 inches (1200 to 1800 mm) in width, 8-inch nominal (184-mm actual) depth for openings 72 to 120 inches (1800 to 3000 mm) in width, and not less than 10-inch nominal (235-mm actual) depth for openings 10 to 12 ft. (3 to 3.6 m) in width.
  - .2 For load-bearing walls, provide double-jamb studs for openings 60 inches (1500 mm) and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated[ or, if not indicated, in accordance with Table R502.5(1) or Table R502.5(2), as applicable, in ICC's International Residential Code for One- and Two-Family Dwellings].
- .4 Provide diagonal bracing in [exterior walls, at both walls of each external corner] [walls, at locations indicated], at 45-degree angle, full-story height unless otherwise indicated. Use [1-by-4-inch nominal- (19-by-89-mm actual-) size boards, let-in flush with faces of studs] [metal wall bracing, let into studs in saw kerf].

### 3.5 INSTALLATION OF FLOOR JOIST FRAMING

## ROUGH CARPENTRY

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- .1 General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches (38 mm) of bearing on wood or metal, or 3 inches (76 mm) on masonry. Attach floor joists as follows:
  - .1 Where supported on wood members, by[ **toe nailing or by**] using metal framing anchors.
  - .2 Where framed into wood supporting members, by using wood ledgers as indicated or, if not indicated, by using metal joist hangers.
- .2 Fire Cuts: At joists built into masonry, bevel cut ends 3 inches (76 mm) and do not embed more than 4 inches (102 mm).
- .3 Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches (1200 mm).
- .4 Do not notch in middle third of joists; limit notches to one-sixth depth of joist, one-third at ends. Do not bore holes larger than one-third depth of joist; do not locate closer than 2 inches (50 mm) from top or bottom.
- .5 Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist at ends of joists unless nailed to header or band.
- .6 Lap members framing from opposite sides of beams, girders, or partitions not less than 4 inches (102 mm) or securely tie opposing members together. Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist over supports.
- .7 Anchor members paralleling masonry with 1/4-by-1-1/4-inch (6.4-by-32-mm) metal strap anchors spaced not more than 96 inches (2438 mm) o.c., extending over and fastening to three joists. Embed anchors at least 4 inches (102 mm) into grouted masonry with ends bent at right angles and extending 4 inches (102 mm) beyond bend.
- .8 Provide solid blocking between joists under jamb studs for openings.
- .9 Under non-load-bearing partitions, provide double joists separated by solid blocking equal to depth of studs above.
  - .1 Provide triple joists separated as above, under partitions receiving ceramic tile and similar heavy finishes or fixtures.
- .10 Provide bridging of type indicated below, at intervals of 96 inches (2438 mm) o.c., between joists.
  - .1 Diagonal wood bridging formed from bevel-cut, 1-by-3-inch nominal- (19-by-64-mm actual-) size lumber, double-crossed and nailed at both ends to joists.
  - .2 Steel bridging installed to comply with bridging manufacturer's written instructions.

## ROUGH CARPENTRY

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### 3.6 INSTALLATION OF CEILING JOIST AND RAFTER FRAMING

- .1 Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.
  - .1 Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- (19-by-184-mm actual-) size or 2-by-4-inch nominal- (38-by-89-mm actual-) size stringers spaced 48 inches (1200 mm) o.c. crosswise over main ceiling joists.
- .2 Rafters: Notch to fit exterior wall plates and[ toe nail or] use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.
  - .1 At valleys, provide double-valley rafters of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches (50 mm) deeper. Bevel ends of jack rafters for full bearing against valley rafters.
  - .2 At hips, provide hip rafter of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches (50 mm) deeper. Bevel ends of jack rafters for full bearing against hip rafter.
- .3 Provide collar beams (ties) as indicated or, if not indicated, provide 1-by-6-inch nominal- (19-by-140-mm actual-) size boards between every third pair of rafters, but not more than 48 inches (1219 mm) o.c. Locate below ridge member, at third point of rafter span. Cut ends to fit roof slope and nail to rafters.
- .4 Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

### 3.7 INSTALLATION OF TIMBER FRAMING

- .1 Install timber beams with crown edge up and provide not less than 4 inches (102 mm) of bearing on supports. Provide continuous members unless otherwise indicated; tie together over supports as indicated if not continuous.

## ROUGH CARPENTRY

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- .2 Where beams or girders are framed into pockets of exterior concrete or masonry walls, provide 1/2-inch (13-mm) airspace at sides and ends of wood members.
- .3 Install wood posts using metal anchors indicated.
- .4 Treat ends of timber beams and posts exposed to weather by dipping in water-repellent preservative for 15 minutes.

### 3.8 PROTECTION

- .1 Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- .2 Protect rough carpentry from weather. If, despite protection, rough carpentry becomes **[wet] [wet enough that moisture content exceeds that specified]**, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

## MISCELLANEOUS ROUGH CARPENTRY

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### Part 1 General

#### 1.1 RELATED DOCUMENTS

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SECTION INCLUDES

- .1 Miscellaneous rough carpentry, including:
  - .1 Roof curbs and perimeter nailers.
  - .2 Blocking in wall and roof openings.
  - .3 Wood furrings.
  - .4 Telephone and electrical panel back boards.
  - .5 Concealed wood blocking for support of wall-mounted items.
  - .6 Wood treatments.

#### 1.3 RELATED SECTIONS

- .1 Division 06 Sections Rough Carpentry for structural assemblies.
- .2 Division 8 Sections for window and door openings to receive wood blocking.

#### 1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordinate curb installation with installation of roofing vapour retarder and parapet construction.

#### 1.5 SUBMITTALS FOR REVIEW

- .1 Product Data: Provide technical data on wood treatment materials. Include physical properties of treated materials based on testing by a qualified independent testing agency. Include copies of warranties from treatment manufacturers for each type of treatment.
- .2 LEED Submittals:
  - .1 Product Data:
    - .1 Credit EQ 4.1: For products and materials required to conform to low emission requirements.
    - .2 Credit MR 4: For products required to have recycled content.
    - .3 Product Certificates for Credit MR 5: For products and materials required to conform to regional requirements.

#### 1.6 SUBMITTALS FOR INFORMATION

- .1 Installation Data: Provide application instructions.

## **MISCELLANEOUS ROUGH CARPENTRY**

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- .2 Certificates for Treated Wood: For products treated by pressure impregnation submit following information certified by authorized signing officer of treatment plant:
  - .1 Information listed in AWP standards applicable to specified treatment.
  - .2 Moisture content after drying following treatment.
  - .3 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.
- .3 Certificates for Fire-Retardant Treatment: From chemical treatment manufacturer and from treating plant, that treated materials comply with requirements.

### **1.7 QUALITY ASSURANCE**

- .1 Lumber Products: Graded and stamped to NLGA requirements.
- .2 Plywood Products: Certified and graded to CANPLY or APA requirements.
- .3 Testing Agency Qualifications – Fire Retardant-Treated Material: For agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction.

## **Part 2 Products**

### **2.1 MATERIALS - GENERAL**

- .1 Regional Materials: Provide sheet and lumber materials in conformance with Credit MR 5.
- .2 Minimum Recycled Content: Provide panel materials with recycled content in conformance with Credit MR 4.
- .3 Maximum VOC Content: Provide panel materials, adhesives, glues and sealants used in the interior of the building with maximum VOC content in conformance with Credit IEQ 4.1

### **2.2 MATERIALS**

- .1 Lumber - General: NLGA (Standard Grading Rules for Canadian Lumber).
  - .1 CSA-0141, softwood SPF no. 2 or better species, grade S4S.
  - .2 Maximum Moisture Content: 19 percent for exterior items; 12 percent for interior items.

## **MISCELLANEOUS ROUGH CARPENTRY**

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### **.2 Lumber for Furring, Blocking and Nailers:**

- .1 Board and Post sizes: "Standard" or better grade.**
- .2 Dimension Sizes: "Standard" light framing or better grade.**

### **.3 Panel Materials:**

- .1 Plywood for Exterior Use: Douglas Fir CSA-0121, APA Rated Sheathing; Exposure Durability 1. Where exposed on any side, use Exterior Exposure Durability classification; unsanded.**
- .2 Plywood for Telephone and Electrical Panel Back Boards and Interior Use: CSA-0121, APA Rated Sheathing; Exposure Durability 1**

### **.4 Treat lumber and panel materials with wood treatments when specified.**

## **2.3 ACCESSORIES**

### **.1 Fasteners and Anchors:**

- .1 Fasteners: Hot dipped galvanized steel for exterior work, interior high humidity areas and treated wood locations, unfinished steel elsewhere. Use fasteners for wall sheathing of type recommended by sheathing manufacturer.**
- .2 Anchors: Toggle bolt type for anchorage to hollow masonry. Provide expansion shield and machine-threaded lag bolt type for anchorage to solid masonry or concrete. Use machine-threaded bolt or ballistic fastener for anchorages to steel. Cast-threaded anchors not permitted.**

### **.2 Adhesives for Gluing: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.**

### **.3 Joint Tape and Sealant for Wall Sheathing: Types as recommended by sheathing manufacturer.**

### **.4 Isolation Tape: Butyl type, for isolating wood from masonry or cementitious materials.**

## **2.4 FACTORY WOOD TREATMENT**

### **.1 Wood Preservative (Pressure Treatment): AWP Treatment U1, Category UC3b using water borne coloured preservative.**

- .1 Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX).**
- .2 Application: Treat plywood, wood nailers, curbs, equipment support bases, blocking and similar members in connection with roofing and flashing, unless otherwise indicated.**



## MISCELLANEOUS ROUGH CARPENTRY

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- .3 Kiln-dry lumber after treatment to specified maximum moisture content. Do not use material that is warped or that does not conform to requirements for untreated material.
- .2 Fire Retardant Treatment (Pressure Treatment): AWPAC Treatment C20 (lumber) and C27 (plywood).
  - .1 Flame Spread Classification: FSC 25 or less.
  - .2 Smoke-Developed Index: 450 or less.
  - .3 Application: Treat plywood, wood nailers and supports in connection with telephone and electrical panel back boards, and where indicated.
  - .4 Kiln-dry lumber after treatment to specified maximum moisture content.
  - .5 Each bundle of fire-retardant treated lumber and each panel to bear ULC label indicating Flame Spread Classification (FSC), and Smoke Developed Index.

### Part 3 Execution

#### 3.1 INSTALLATION - GENERAL

- .1 Install members true to line, levels and elevations, square and plumb.
- .2 Construct continuous members from pieces of longest practical length.
- .3 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .4 Roof Curbs: Curb roof openings except where prefabricated curbs or other materials are provided. Form corners by alternating lapping side members.
- .5 Countersink bolts where necessary to provide clearance for other work.
- .6 Isolate wood in contact with masonry or cementitious construction with butyl tape.

#### 3.2 NAILERS, FURRING AND BLOCKING

- .1 Install furring and blocking as required to space-out and support built-in item, wall and ceiling finishes, telephone and electrical panel back boards, and other work.
- .2 Install nailers and linings to rough openings as required to provide backing for frames and other work.
- .3 Nailers, Furring and Blocking: Of sufficient size, spacing and anchorage to support and transfer loads to substrates, and designed to accommodate movement and deflection of adjacent construction

## **MISCELLANEOUS ROUGH CARPENTRY**

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### **3.3 TELEPHONE AND ELECTRICAL PANEL BACK BOARDS**

- .1 Install plywood panels with square edges. Size boards 24 inches (600 mm) beyond size of electrical panel. Screw fasten to framing.

### **3.4 WOOD TREATMENT TOUCH-UP**

- .1 Apply preservative treatment in accordance with manufacturer's written instructions.
- .2 Brush apply two coats of preservative treatment and fire-retardant treatment to site-sawn cuts.
- .3 Allow preservative to dry prior to erecting members.

**END OF SECTION**

## FINISH CARPENTRY

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### 1. General

#### 1.1 GENERAL REQUIREMENTS

1.1.1 Conform to requirements of Division 1.

#### 1.2 QUALITY ASSURANCE

1.2.1 All work is to comply with Architectural Woodwork Quality Standards Illustrated (QSI) eighth edition, Version 1, 2003 published by AWI/AWMAC. Custom Grade, except where specified otherwise.

1.2.2 Execute work by fully equipped, expert craftsmen, highly skilled in fabrication and installation of work specified in this Section.

#### 1.3 SUBMITTALS

1.3.1 **Samples:** Submit the following samples in accordance with Section 01300.

- .1 Each plastic laminate one sample tag.
- .2 Samples are to bear identification of the project, consultant, general contractor and the supplier.

1.3.2 **Shop drawings:** Submit shop drawings in accordance with Section 01300. Indicate the following:

- .1 system arrangement, cut-outs for mechanical and electrical services and related items.
- .2 method of assembly including jointing, fastening, strapping and large scale details of construction
- .3 finishes

### 2. Products

#### 2.1 MATERIALS

2.1.1 **Wood members:** CAN/CSA-0141, S4S, clean, seasoned, straight, square and true on all four sides. Grade-mark wood materials to NLGA Standard Grading Rules for Canadian Lumber. Kiln dry wood materials to a moisture content of 4% to 8%.

2.1.2 **Plywood:** Douglas fir plywood to CAN/CSA-0121, standard construction or Canadian softwood plywood to CAN/CSA-0151, standard construction.

2.1.3 **Plastic laminate:** CAN3-A172, thickness tolerances in accordance with Table 1 of the Standard. Unless otherwise specified, use the following:

- .1 Postformed work: Grade PF, Type S, minimum 0.048" thick.

## FINISH CARPENTRY

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- .2 Horizontal and vertical flat work: Grade GP, Type S, minimum 0.048" thick.
- .3 Backing sheet: Grade BK, not less than 0.02" thick sanded one face and manufactured by the same manufacturer as the facing sheet.

2.1.4 **Particleboard core:** ANSI A208.1, high density, mat formed wood particleboard.

2.1.5 **Wood veneer:** Refer to Finishes Schedule for wood veneer information.

2.1.6 **Hardwood plywood:** CSA 0115, Type II.

2.1.7 **Hardboard:** CAN/CGSB-11.3, impregnated, pressed wood with a tempering compound and polymerized by baking.

2.1.8 **Sealer:** Water-repellent, clear, colourless, penetrating wood preservative, LePage's Wood Preservative by LePage's Ltd., Super Solignum by Solignum Inc., Pentox by Osmose-Pentox Inc.

2.1.9 **Adhesive:** CSA 0112, waterproof type, suitable for specific end use.

## 2.2 CABINET HARDWARE

2.2.1 Supply hardware with fasteners and other items and parts required for complete installation and functioning.

2.2.2 **Shelf standard and support clip:** 255NP, flush mounted, by Knape & Vogt Canada Inc. , 256NP, 1 clip for each 12" length or fraction thereof, by Knape & Vogt Canada Inc.

2.2.3 **Adjustable brackets:** No. 80 Standards and No.180 brackets in white finish, by Knape & Vogt Canada Inc.

2.2.4 **Drawer slide:** 1429, full extension, zinc coated steel by Knape & Vogt Canada Inc.

2.2.5 **Cupboard hinge:** 170 degree opening, nickel plated steel mounting plate and self-closing hinge with zinc die cast screwed on cup model 91A6500 and 91A6600 and adhesive back plastic door bumpers model TP1950 by Julius Blum Canada Ltd.

2.2.6 **D pull:** 4484, chrome plated, C26D, by Stanley

2.2.7 **Push Latches:** Hafele, Magnetic Pressure Push Latch 1.4kg pull

2.2.8 **Inactive Leaf Elbow Catch:** Ives, Elbow Catch No.2

2.2.9 **Keyed lock:** 987 NP, by Knape & Vogt Canada Inc. Provide two change keys per lock.

## **FINISH CARPENTRY**

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### **2.3 CASEWORK FABRICATION**

- 2.3.1 Fabricate casework to Custom Quality Standards in accordance with QSI, Section 400, Architectural Cabinets.
- .1 Casework type: flush overlay
  - .2 Interpret exposed, semi-exposed and concealed components and surfaces, as defined in the Quality Standards
  - .3 Exposed parts except counter tops
  - .4 Face and edge band finish: P.Lam
  - .5 Minimum thickness for doors and drawer fronts: 3/4"
  - .6 Provide edge banding to apron and valance edges
  - .7 Counter tops
  - .8 Core: Particle Board except shelves to be plywood
  - .9 Edge detail
- 2.3.2 Provide necessary cutouts, to templates, for services, fixtures, and trim as necessary.

### **2.4 PLASTIC LAMINATE WORK**

- 2.4.1 Provide plastic laminate to core material in accordance with laminate and adhesive manufacturer's instructions. Use continuous lengths up to 10'-0". Design joints 24" from sink cutouts.
- 2.4.2 Provide laminate backing sheets to reverse side of core of plastic laminate work.
- 2.4.3 Provide flush hairline joints in counter tops.

## **3. Execution**

### **3.1 INSTALLATION**

- 3.1.1 Deliver and install the work of this Section in accordance with the requirements and recommendations of Section 400 of the QSI standard.
- 3.1.2 Scribe and cut casework as necessary to fit abutting walls and surfaces, to fit properly into recesses, and to accommodate piping, columns, fixtures, inserts, grilles, appliances, outlet boxes, or other projecting, intersecting or penetrating objects. Seal exposed counter cores.
- 3.1.3 Provide the work of this Section plumb, true, square, neatly scribed to adjoining surfaces and anchored securely.
- 3.1.4 Provide allowances around perimeter where fixed objects pass through or project into laminated plastic work to permit normal movement without restriction.

## **FINISH CARPENTRY**

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- 3.1.5 Provide casework hardware as indicated and/or implied, and verify smooth and free movement of operating assemblies.
- 3.1.6 Fasten shelving standards securely to metal wall studs with solid blocking behind.

**END OF SECTION**

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## **THERMAL INSULATION**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Blanket insulation.
- .2 Board insulation for foundation perimeters.
- .3 Filling of voids and spaces in exterior walls with insulation other than foamed-in-place insulation.
- .4 Instructions for Sections referencing this section for installation.

#### **1.3 RELATED SECTIONS**

- .1 Division 07 Section Bituminous Dampproofing, for perimeter foundations requiring board insulation.
- .2 Division 07 Section Foamed-in-Place Insulation. Includes filling of voids, spaces and opening perimeter joints in exterior walls.
- .3 Division 07 Section Above-Grade Vapour Retarders.
- .4 Division 07 Sections for Roofing: Insulation at roof system.
- .5 Division 08 Section Storefronts: Insulation in storefronts.

#### **1.4 SYSTEM DESCRIPTION**

- .1 Materials of This Section: Provide continuity of thermal barrier at building enclosure elements in conjunction with thermal insulating materials in applicable related Sections and in adjoining construction.
- .2 Materials of This Section: Provide thermal protection to air seal materials at building enclosure elements in conjunction with air barrier materials in Division 07 Sections Air Barriers.

#### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination:



## **THERMAL INSULATION**

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- .1 Coordinate with other work having a direct bearing on work of this section.
- .2 Coordinate the work with Division 07 Section Weather Barriers, for air seal materials.

### **1.6 SUBMITTALS FOR REVIEW**

- .1 Product Data: Provide data on product characteristics, performance criteria, and limitations.

### **1.7 SUBMITTALS FOR INFORMATION**

- .1 Installation Data: Indicate special environmental conditions required for installation, and installation techniques.
- .2 Manufacturer's Certificates: Certify that products meet or exceed specified requirements.

### **1.8 MOCK-UP**

- .1 Provide mock-up of materials of this section with exterior wall assembly mock-ups specified in related Sections.
- .2 Locate where directed by Consultant.
- .3 Approved mock-up may remain as part of the Work.

### **1.9 ENVIRONMENTAL REQUIREMENTS**

- .1 Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.
- .2 Coordinate insulation installation with installation of materials installed over insulation so insulation is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

## **Part 2 Products**

### **2.1 MATERIALS - GENERAL**

- .1 Use insulations free of HCFCs, CFCs and CFC compounds, and formaldehyde during manufacturing and in installed products.

### **2.2 INSULATION MATERIALS**

## **THERMAL INSULATION**

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- .1 Unfaced Mineral-Wool Blanket Insulation: CAN/ULC-S702 Type 1, preformed mineral fibre, friction fit, conforming to the following:
  - .1 Thermal Resistance: Not less than R4 per inch thickness.
  - .2 Size: 48 inches (1200 mm) x width to suit stud space.
  - .3 Thickness: As indicated.
  - .4 Flame/smoke properties: 0/0 in accordance with ASTM E84
  - .5 Product: Roxul ComfortBatt manufactured by Roxul, or comparable product.
- .2 Exterior Wall, Under-Slab and Foundation Perimeter Insulation: Rigid extruded polystyrene insulation (XPS), CAN/ULC-S701 Type 4 or ASTM C578 Type IV, closed cellular type, conforming to the following:
  - .1 Compressive Strength: 173 kPa (25 psi).
  - .2 Thermal Resistance: RSI of 0.87/25 mm.
  - .3 Water Absorption: 0.1 percent by volume maximum.
  - .4 Board Thickness: As indicated on drawings.
  - .5 Board Edges: Shiplap design.
  - .6 Flame/Smoke Properties: 15 /140 in accordance with CAN/ULC-S102 or ASTM E84.
  - .7 Product: GreenGuard XPS Insulation manufactured by Pactiv, [www.green-guard.com](http://www.green-guard.com), or comparable product.
- .3 Gap-Filling Insulation: Single component polyurethane foam
  - .1 Product: Isofoam manufactured by Ener-Gard Energy Products, Enerfoam by Abisko Manufacturing, or comparable product.
- .4 Spray Foam Insulation: Spray-applied Medium Density Polyurethane Foam conforming to CAN/ULC-S705.1 (including amendments 1 and 2)
  - .1 Product: Walltite manufactured by BASF, 2 lb,

### **2.3 ACCESSORIES**

- .1 Protection Board: Type as recommended by insulation manufacturer for application indicated.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verify that substrate, adjacent materials, and insulation boards are dry and ready to

## **THERMAL INSULATION**

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receive insulation and adhesive.

- .2 Verify substrate surface is flat, free of irregularities, and materials or substances that may impede adhesive bond or affect performance of insulation.
- .3 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION – GENERAL**

- .1 Conform to insulation manufacturer's instructions applicable to products and applications indicated.
- .2 Install insulation that is undamaged, dry, unsoiled, and that has not been left exposed to ice, rain, or snow at any time.
- .3 Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation to attain thermal-tight construction. Remove projections that interfere with placement.
- .4 Provide sizes to fit applications indicated and selected from manufacturer's largest size standard widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

### **3.3 BLANKET INSULATION**

- .1 Install insulation in interior construction spaces where indicated.
- .2 Fill void spaces tightly without gaps. Do not compress insulation.
- .3 Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- .4 Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation.
- .5 Coordinate installation with installation of vapour retarders specified in Division 07 Section Above-Grade Vapour Retarders.

### **3.4 RIGID BOARD INSULATION - FOUNDATION PERIMETER**

- .1 Install boards directly against drainage panel, unless otherwise indicated.
- .2 Apply adhesive to temporarily hold boards in place until backfill is in place
- .3 Install boards horizontally, unless otherwise recommended by insulation manufacturer.

## **THERMAL INSULATION**

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- .1 Stagger end joints.
- .2 Butt edges and ends tight to adjacent board and to protrusions.
- .4 Extend boards over movement joints, unbonded to substrate 50 mm on one side of joint.
- .5 Cut and fit insulation tight to protrusions or interruptions to the insulation plane.
- .6 Fill gaps flush that are not tight fitting with gap-filling foamed-in-place insulation, in accordance with Division 07 Section Foamed-in-Place Insulation.
- .7 Immediately following application of board insulation, place protective boards over exposed insulation surfaces.

### **3.5 APPLICATION OF SPRAY FOAM INSULATION**

- .1 Apply insulation in accordance with manufacturer's instructions and referenced standard. Protect workers as recommended by CAN/ULC-S705.2.
- .2 Apply insulation by spray method, to a uniform monolithic density without voids. Do not exceed manufacturer's recommended material lifts.
- .3 Do not apply insulation to void spaces in exterior walls when required continuous thickness cannot be attained. Apply other insulation as indicated. Where not indicated, apply insulation of type and to extent as directed.
- .4 Apply to a minimum cured thickness as indicated.
- .5 Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets are completed and windows, electrical boxes, and other items not indicated to receive insulation are masked.
- .6 Patch damaged areas.

### **3.6 EXTERIOR WALL VOID SPACES**

- .1 Install mineral wool board insulation in miscellaneous void spaces in exterior walls with board insulation where indicated, and when insulations in other Sections cannot provide the required continuous thickness or performance.
- .2 Fill void spaces tightly without gaps. Do not compress insulation.

### **3.7 PROTECTION OF FINISHED WORK**

- .1 Do not permit work to be damaged prior to covering insulation.

**END OF SECTION**

## **BOARD INSULATION**

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### **Part 1 GENERAL**

#### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Section 03 30 00 - Cast in Place Concrete.
- .4 Section 06 10 53 - Miscellaneous Rough Carpentry.
- .5 Section 07 26 00 - Vapour Retarders.

#### **1.2 REFERENCES**

- .1 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM C1289, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- .2 Canadian Standards Association (CSA)
  - .1 CSA B149 PACKAGE, Consists of B149.1 Natural Gas and Propane Installation Code and B149.2, Propane Storage and Handling Code.
- .3 Canadian General Standards Board (CGSB).
  - .1 CGSB 71-GP-24M, Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .4 Underwriters Laboratories of Canada (ULC).
  - .1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
  - .2 CAN/ULC-S702, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
  - .3 CAN/ULC-S704, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.

#### **1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data.

## **BOARD INSULATION**

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- .2 Submit two copies of WHMIS SDS - Safety Data Sheets. Indicate VOC's insulation products and adhesives.
- .2 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

### **1.4 QUALITY ASSURANCE**

- .1 Provide certificate of quality compliance from insulation manufacturer.

## **PART 2 PRODUCTS**

### **2.1 INSULATION**

- .1 Expanded polystyrene (EPS): for use below grade and exterior walls: to CAN/ULC-S701 Type 2, RSI 0.70 per 25 mm, total thickness as indicated on drawings.
- .2 Urethane (Isocyanurate): Faced, to CAN/ULC-S704 foil facing, RSI 1.05 per 25 mm, total thickness as indicated on drawings.
- .3 Mineral fibre board: to CAN/ULC-S702, Type 2, semi-rigid, density 17.6 kg/m<sup>2</sup>, flexible spinbonded olefin facing, RSI 0.70 per 25 mm, total thickness as indicated on drawings.
- .4 Extruded polystyrene (XPS): to CAN/ULC S701 Type 3, RSI 0.88 per 25 mm, total thickness as indicated on drawings.
- .5 Insulation types not indicated on drawings to be expanded polystyrene (EPS), Type 2 as a default, as per article 2.1.1.

### **2.2 ADHESIVE**

- .1 Adhesive suitable for bonding polystyrene and mineral fibre insulation to substrates as indicated.

### **2.3 ACCESSORIES**

- .1 Insulation clips: impale type, perforated 50 x 50 mm cold rolled carbon steel 0.8 mm thick, spindle of 2.5 mm diameter annealed steel, length to suit insulation, 25 mm diameter washers of self locking type.
- .2 Joint sealing tape: air resistant pressure sensitive adhesive tape as recommended by insulation manufacturer.

## **BOARD INSULATION**

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### **PART 3      EXECUTION**

#### **3.1      MANUFACTURER'S INSTRUCTIONS**

- .1      Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions and data sheets.

#### **3.2      WORKMANSHIP**

- .1      Install insulation after building substrate materials are dry.
- .2      Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .3      Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
- .4      Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and CSA B149.1 and CSA B149.2 type B and L vents.
- .5      Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .6      Offset both vertical and horizontal joints in multiple layer applications.
- .7      Do not enclose insulation until it has been inspected and approved by Owner.

#### **3.3      EXAMINATION**

- .1      Examine substrates and immediately inform Owner in writing of defects.
- .2      Prior to commencement of work ensure:
  - .1      Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

#### **3.4      RIGID INSULATION INSTALLATION**

- .1      Apply adhesive to insulation board in accordance with manufacturer's recommendations.
- .2      Imbed insulation boards into vapour barrier type adhesive, applied as specified, prior to skinning of adhesive.

## **BOARD INSULATION**

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- .3 In addition to adhesive install mineral fibre insulation boards with insulation clips and disk, 2 per 600 x 1200 mm board minimum, fit boards tight, cut off fastener spindle 3 mm beyond disk.
- .4 Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 150 mm wide 0.15 mm modified bituminous membrane over expansion and control joints using compatible adhesive and primer before application of insulation.
- .5 Carefully inspect for continuity of air barrier prior to placement of insulation.

### **3.5 PERIMETER FOUNDATION INSULATION**

- .1 Exterior application: extend boards vertically below bottom of finish floor slab to depth as indicated on drawings. Install on exterior face of perimeter foundation wall with adhesive.

### **3.6 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**



## **BLANKET INSULATION**

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### **PART 1 GENERAL**

#### **1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Section 06 10 53 - Miscellaneous Rough Carpentry.
- .4 Section 07 26 00 - Vapour Retarders.

#### **1.2 REFERENCES**

- .1 American Society for Testing and Materials, (ASTM).
  - .1 ASTM C553, Specification for Mineral Fibre Blanket Thermal Insulation for Commercial and Industrial Applications.
  - .2 ASTM C665, Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
  - .3 ASTM C1320, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
  - .4 ASTM E84, Test Method for Surface Burning Characteristics of Building Materials.
- .2 Canadian Standards Association (CSA International).
  - .1 CSA B111, Wire Nails, Spikes and Staples.
  - .2 CSA B149 PACKAGE, Consists of B149.1, Natural Gas and Propane Installation Code and B149.2, Propane Storage and Handling Code.
- .3 Underwriters Laboratories of Canada (ULC).
  - .1 CAN/ULC-S702, Standard for Mineral Fibre Insulation.

#### **1.3 SUBMITTALS**

- .1 Product Data:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet.
- .2 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation instructions.

## **BLANKET INSULATION**

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### **PART 2 PRODUCTS**

#### **2.1 INSULATION**

- .1 Thermal batt and blanket mineral fibre:
  - .1 Unfaced glass fiber thermal insulation to ASTM C665 Type I, thickness and RSI value as indicated on drawings.
  - .2 Semi-rigid mineral wool batt insulation to CSA/ULC-S702, made from basalt rock and slag, thickness and RSI value as indicated on drawings.
- .2 Acoustic batt insulation:
  - .1 Unfaced glass fiber acoustical insulation to ASTM C665, Type I, thickness as indicated.
    - .1 Flame spread: 10 to ASTM E84.
    - .2 Smoke development: 10 to ATSM E84.
    - .3 Sound transmission Class: STC 49.
    - .4 Dimensional stability: linear shrinkage less than 0.1%.

### **PART 3 EXECUTION**

#### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

#### **3.2 INSULATION INSTALLATION**

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces and for sound attenuation as noted on drawings.
- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.
- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls and CSA B149.1 and CSA B149.2 Type B and L vents.
- .5 Do not enclose insulation until it has been inspected and approved by Owner.

## **BLANKET INSULATION**

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### **3.3 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

## **WEATHER BARRIERS**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Water-resistive barrier building wrap primary sheet seal over sheathing, for building enclosure walls.
- .2 Flexible sheet flashing materials to connect and seal openings, joints, and junctions between water-resistive barrier and other air seal materials and assemblies.

#### **1.3 RELATED SECTIONS**

- .1 Division 06 Section Rough Carpentry: Wall sheathing.
- .2 Division 07 Section for roofing membrane and vapour retarder.
- .3 Division 07 Section Joint Sealants: Sealant materials and installation techniques.
- .4 Division 08 Sections for frames of doors, storefronts and windows functioning as a primary air seal.

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Membranes and flashings for this Project shall include characteristics and properties required by applicable codes for use as a water-resistive barrier.
- .2 Provide continuity of air seal materials and assemblies in conjunction with materials described in related sections and other sections specifying exterior wall materials and assemblies.
- .3 Provide full adhesion of sheet flashings in accordance with performance values of membrane manufacturer's tested assemblies.

#### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Sequence work to permit installation of materials in conjunction with related materials and seals.
- .2 Pre-installation Conference: Convene two weeks before starting work of this Section.

## **WEATHER BARRIERS**

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- .1 Include parties directly affecting work of this Section, including, membrane manufacturer's technical representative, installer's job foreman, building envelope consultant and Consultant.
- .2 Review submittals.
- .3 Review preparation and installation procedures and coordination and scheduling required with related work. Include preparation of acceptable substrates, substrate conditions and moisture testing, protection of completed work, application requirements, protection of substrates and unfinished work, review of details at penetrations and interfaces with adjacent materials.
- .4 Review required inspections and testing.
- .5 Record and submit copies of minutes including discussions, decisions, agreements, and disagreements to each party attending and concerned parties not in attendance.

### **1.6 SUBMITTALS FOR REVIEW**

- .1 Shop Drawings: Provide drawings of special joint conditions.
- .2 Product Data: Provide data on material characteristics, performance criteria, and limitations.
- .3 LEED Submittals:
  - .1 Provide product data as required to meet the LEED requirements.

### **1.7 SUBMITTALS FOR INFORMATION**

- .1 Qualification Data: For Installer.
- .2 Manufacturer's Installation Instructions: Indicate preparation, installation requirements and techniques, product storage and handling criteria.

### **1.8 QUALITY ASSURANCE**

- .1 Perform Work in accordance with SWRI - Sealant and Caulking Guide Specification requirements for installation.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by the manufacturer.
- .3 Single Source Responsibility: Obtain water-resistive barrier and flexible flashing materials each from single and same manufacturer.

### **1.9 MOCK-UPS**

- .1 Provide mock-up **upon request by architect** of each barrier system, which is comprised of a variety of materials.

## **WEATHER BARRIERS**

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- .2 Construct wall assembly mock-up size and shape as determined on site of typical exterior wall, incorporating a window and door frame.
- .3 Illustrate construction at interface and seals with insulation, building corner condition, junction with roof membrane and vapour retarder, junction of wall and top of foundation.
- .4 Locate mock-up where directed.
- .5 Mock-up may remain as part of the Work.

### **1.10 ENVIRONMENTAL REQUIREMENTS**

- .1 Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.
- .2 Cover finished installed work no later four weeks after application.
- .3 Commence covering sheet weather barrier materials on southern-exposure wherever possible.
- .4 Apply sealants and mastics within recommended application temperature ranges. Consult manufacturer when materials cannot be applied within these temperature ranges.

### **1.11 WARRANTY**

- .1 Installer's Warranty:
  - .1 Provide a five year warranty to include coverage for failure to meet specified requirements.
  - .2 Warranty: Include coverage of installed sealants and sheet materials which fail to achieve air tight seal, exhibit loss of adhesion or cohesion, or do not cure.
- .2 Manufacturer's Warranty: Membrane manufacturer's five year material warranty.

## **Part 2 Products**

### **2.1 MATERIALS, GENERAL**

- .1 Low Emitting Materials: Provide adhesives used inside the weatherproofing system with maximum VOC content in conformance with LEED Credit EQ 4.1.

### **2.2 WATER-RESISTIVE BARRIER**

## **WEATHER BARRIERS**

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- .1 Self-Adhering Building Wrap: Reinforced modified polyolefin tri-laminate, sheet air barrier membrane, water-resistant, vapour permeable; with flame- spread and smoke-developed indexes of less than 5 and 125, respectively, when tested according to ASTM E84; release-film backing, blue colour.
- .1 Subject to compliance with requirements, provide Blueskin VP 100 manufactured by Henry Company, complying with the following.
  - .1 Air leakage: ASTM E2178, maximum 0.02 L/s/sq. m at 75Pa.
  - .2 Water Vapor Permeance: 33 perms, ASTM E96, Method B.
  - .3 Resistance to Water Penetration: Pass ICC-ES AC 38.
  - .4 Basis Weight: Minimum 100 gm/sq. m.

### **2.3 FLEXIBLE SHEET FLASHINGS**

- .1 General: Provide self-adhesive sheet flashings to greatest extent possible. Use torch-applied sheet materials of same specification and manufacture where manufacturer advises performance of self-adhering sheets cannot be realized.
- .1 Transition Strips - Windows and Door Openings: SBS modified bituminous sheet, self-adhering, foil-faced, unless otherwise specified.
  - .1 Products: Subject to conformance with requirements, provide Protecto Seal 45, Aluminum Silver colour, manufactured by Protecto Wrap, or one of the following:
    - .1 Foilskin by Henry Company.
    - .2 Perm-a-Barrier Aluminum Flashing by W. R. Grace, & Co.
  - .2 Roof Parapet Cap Flashing: SBS modified bituminous sheet with bitumen integrally laminated to a cross laminated polyethylene film, minimum 1 mm thickness, 500 psi minimum tensile strength, 0.05 perms water vapor transmission value.
    - .1 Product: Subject to conformance with requirements, provide Blueskin PE 200 HT manufactured by Henry Company, or comparable product by W. R. Grace, & Co.
  - .3 Through-Wall Flashings: Modified Bituminous Self-Adhesive Sheets: SBS modified bitumen integrally laminated to a cross laminated polyethylene film, minimum 1 mm thickness, 500 psi minimum tensile strength, 0.05 perms water vapor transmission value.
    - .1 Product: Subject to conformance with requirements, provide Protecto Wrap PW 100/40 manufactured by Protecto Wrap, or one of the following:
      - .1 Blueskin TWF by Henry Company.
      - .2 ExoAir TWF by Tremco Inc.
      - .3 Perm-a-Barrier Wall Flashing by W. R. Grace, & Co.
    - .2 Metal Drip Flashing: Attach metal drip flashing as specified in Division 07 Section

## WEATHER BARRIERS

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Sheet Metal Flashing and Trim.

### 2.4 ACCESSORIES

- .1 Wood Substrate and Framing Joint Treatment Materials:
  - .1 Reinforcing Tape: Mesh of open weave glass fabric yarn saturated with synthetic resins.
    - .1 Product: 990-06 Yellow Jacket manufactured by Henry Company.
  - .2 Mastic Adhesive: Compatible with weather barrier sheet materials and substrate, uniform knife or trowel grade consistency.
- .2 Sealants:
  - .1 Sealant: Type compatible with sheet seal, substrate and adjacent materials, as recommended by manufacturer of air barrier sheet material. Use low emitting materials as specified in Division 07 Section Joint Sealants.
  - .2 Primer: Recommended by sealant manufacturer and appropriate to application.
  - .3 Substrate Cleaner: Non-corrosive, type recommended by sealant manufacturer, and compatible with adjacent materials.
- .3 Foamed-in-Place Sealant: Gap-filling insulation as specified in Division 07 Section Foamed-in-Place Insulation, for filling gaps at penetrations and openings.
- .4 Thinner and Cleaner for Flexible Sheet Flashings: As recommended by sheet material manufacturer.
- .5 Primers for Water-Resistive Barrier and Flexible Sheet Flashings: Product recommended by manufacturer of flexible flashing for substrate.
- .6 Nails: ASTM F1667.
- .7 Flashing Bar Anchors: Galvanized steel bars and anchors, as recommended by manufacturer of air barrier sheet material.

## Part 3 Execution

### 3.1 EXAMINATION

- .1 Verify that surfaces and conditions are ready to accept the work of this section.
- .2 Proceed with installation only after unsatisfactory conditions have been corrected.



## **WEATHER BARRIERS**

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### **3.2 PREPARATION**

- .1 Remove loose or foreign matter which might impair adhesion of materials. Ensure metal surfaces are free of sharp edges and burrs.
- .2 Clean and prime substrate surfaces to receive, water-resistive barrier, flexible sheet flashings and sealants in accordance with manufacturer's instructions.
- .3 Wood Sheathing and Substrate Joint Treatment:
  - .1 Over joints up to 6 mm in width, apply 50 mm wide reinforcing tape fully embedded in trowel applied mastic adhesive.
  - .2 Over joints exceeding 6 mm in width, install flexible sheet flashing as specified.
- .4 Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air barrier material with foam sealant in accordance with Division 07 Section Foamed-in-Place Insulation.

### **3.3 WATER-RESISTIVE BARRIER INSTALLATION**

- .1 Install sheet barrier in accordance with manufacturer's instructions.
- .2 Cover exposed exterior surface of sheathing with water-resistive barrier. Apply immediately after sheathing is installed.
- .3 Lap ends minimum 75 mm and sides 50 mm. Stagger vertical joints.
- .4 Pressure roll sheet barrier surfaces and laps with manufacturer recommended roller attaining full contact with wrinkle-free surface.
- .5 At end of each work day seal top edge of incomplete sheet barrier to substrate with sealant to shed water.
- .6 Do not cover sheet barrier until it has been tested and inspected by Owner's testing agency.
- .7 Repairs: Repair tears and voids. Slit and flatten fishmouths and blisters. Patch with sheet barrier extending 150 mm beyond repaired areas in all directions.

### **3.4 FLEXIBLE SHEET FLASHING INSTALLATION**

- .1 Install materials in accordance with manufacturer's instructions.
- .2 Install flexible sheet flashings and accessory materials, to join water- resistive barrier materials of other sections or adjacent work, to form a seal with adjacent construction

## **WEATHER BARRIERS**

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and maintain a continuous weather barrier seal.

- .3 Apply primers for self-adhering and torch-applied sheets using equipment and application rates in accordance with manufacturer's instructions. Allow primers to dry before applying weather barrier sheets.
- .4 Seal sheet flashings with full contact to substrates. Supplement with sealant as recommended by manufacturer. Roll firmly to enhance adhesion. Use continuous metal bar with anchors at locations recommended by sheet manufacturer.
- .5 Seal sheet flashings around penetrations with sealant.
- .6 Lap sheet flashings onto adjoining substrates. Position lap seal over firm bearing.
- .7 Lap sheet flashings onto roof vapour retarder and seal with sealant. Position lap seal over firm bearing.
- .8 Install sheet flashings between window, and door frames, onto adjacent wall seal materials with sealant. Position lap seal over firm bearing.
- .9 Seal top of through-wall flashings to weather barrier with an additional 150 mm wide, sheet transition strip.
- .10 Caulk edges of seams, cuts, penetrations and terminations not concealed by other flashings, with sealant.
- .11 Lap sheet flashings on to surfaces as follows:
  - .1 Sheet Laps: 75 mm.
  - .2 On to Walls or Columns: 100 mm.
  - .3 On to Roofs and Horizontal Surfaces: 150 mm.
  - .4 On to Metal Frames in Openings: 38 mm.
- .12 Repair punctures, voids, and deficient lapped seams in flashings. Slit and flatten fishmouths and blisters. Patch with transition strips extending 150 mm beyond repaired areas in strip direction.

### **3.5 FIELD QUALITY CONTROL**

- .1 Owner will engage independent agency to perform inspection and testing of installation in successive stages. Do not proceed with installations of membranes for the next area until inspections and tests for previously completed installations of assemblies show conformance with requirements.
- .2 Manufacturer's Field Services:

## **WEATHER BARRIERS**

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- .1 Barrier and flashing manufacturers to provide field surveillance of the installation of their products, including technical assistance and application guidance.
- .2 Monitor and report installation procedures and unacceptable conditions.

### **3.6 PROTECTION OF FINISHED WORK**

- .1 Do not permit adjacent work to damage work of this section.
- .2 Protect weather barrier installation from damage and wear during application and for remainder of construction period, according to manufacturer's written instructions.

**END OF SECTION**

## **ABOVE-GRADE VAPOUR RETARDERS**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Sheet vapour retarders and sealant materials for controlling vapour diffusion.

#### **1.3 RELATED SECTIONS**

- .1 Division 05 Section Structural Metal Stud Framing: Metal stud framing to receive vapour retarders.

#### **1.4 DEFINITION**

- .1 Vapour Retarder: A material or assembly of materials that resists water vapour diffusion through it.

#### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination:
  - .1 Coordinate Work to permit installation of materials in conjunction with other retardant materials and seals, and air barrier assemblies.
  - .2 Do not install vapour retarder until penetrating items are in place.
- .2 Pre-installation Conference: Convene two weeks before starting work of this Section.
  - .1 Include parties directly affecting work of this Section, including, vapour retarder manufacturer's technical representative, installer's job foreman, building envelope consultant and Consultant.
  - .2 Review submittals.
  - .3 Review preparation and installation procedures and coordination and scheduling required with related work. Include preparation of acceptable substrates, substrate conditions, protection of completed work, application requirements, protection of substrates and unfinished work, review of details at penetrations and interfaces with adjacent materials.
  - .4 Review required inspections and testing.
  - .5 Record and submit copies of minutes including discussions, decisions, agreements, and disagreements to each party attending and concerned parties not in attendance.

## **ABOVE-GRADE VAPOUR RETARDERS**

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### **1.6 SUBMITTALS FOR REVIEW**

- .1 Product Data: Provide data indicating material characteristics, performance criteria, limitations for each material and accessory.

### **1.7 QUALITY ASSURANCE**

- .1 Perform Work in accordance with SWRI - Sealant and Caulking Guide Specification requirements for materials and installation.

## **Part 2 Products**

### **2.1 SHEET VAPOUR RETARDER**

- .1 Super Six 6 Mil Polyethylene Vapour Retarder: Clear sheet, 6 mils thick, with maximum Class 1 permeance rating of 0.01 to 0.1perm measured in accordance with ASTM E 96 Dessicant method.
  - .1 Product: 6 Mil Polyethylene.

### **2.2 ACCESSORIES**

- .1 Adhesive for Vapour Retarders: Product recommended by vapour retarder manufacturer and has demonstrated capability to bond vapour retarders securely to substrates indicated.
- .2 Vapour Retarder Tape: Pressure-sensitive adhesive tape, air-resistant, type recommended by vapour retarder manufacturer for sealing joints and penetrations in vapour retarder, minimum 50 mm wide, compatible with sheet material.
- .3 Electrical Vapour Barrier Box: Rigid, moulded polyethylene box with reinforced flanges, for use with recessed electric switch and outlet device boxes, light fixtures and around services behind access doors.

## **Part 3 Execution**

### **3.1 PREPARATION**

- .1 Clean substrates of substances that are harmful to vapour retarders, including removing projections capable of puncturing vapour retarders.

## **ABOVE-GRADE VAPOUR RETARDERS**

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### **3.2 INSTALLATION**

- .1 Install materials according to manufacturer written instructions on side of construction indicated.
- .2 Install sheet barrier in largest possible sheet sizes; minimize number of joints.
- .3 Extend vapour retarders to extremities of areas to protect from vapour transmission.
- .4 Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapour retarders with vapour-retarder tape to create an airtight seal between penetrating objects and vapour retarders.
- .5 Seal vertical joints in vapour retarders over framing by lapping no fewer than two studs and sealing with vapour-retarder tape according to vapour retarder manufacturer's written instructions. Locate all joints over framing members or other solid substrates.
- .6 Provide continuity of sheet barrier at junctions between interior and exterior construction. Extend sheets between and behind wall, floor or ceiling framing members. Provide minimum 19mm continuous mastic sealant bead at all structural and metal deck member junctions and overlap sheets.
- .7 At framed openings install sheet barrier between opening frame and adjacent vapour retarder or weather barrier and seal.
- .8 Vapour Barrier Box: Install vapour barrier boxes at electric outlet and switch locations penetrating vapour retarder in exterior walls. Lap and seal perimeter with sheet barrier. Seal wiring penetrations through boxes.
- .9 Inspect sheets for continuity. Repair tears or punctures immediately before concealment by other work. Cover with tape or another layer of sheet vapour retarder.

### **3.3 PROTECTION**

- .1 Protect vapour retarders from damage until concealed by permanent construction.

**END OF SECTION**

## **AIRSEAL MEMBRANE**

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### **1. General**

#### **1.1 GENERAL REQUIREMENTS**

1.1.1 Conform to requirements of Division 1.

#### **1.2 QUALITY ASSURANCE**

- 1.2.1 Airseal membrane manufacturer's inspection: Arrange for a technical representative to:
- .1 Visit the site and discuss any special requirements, procedures and unique conditions, prior to commencement of work.
  - .2 Inspect substrate surfaces and recommend solutions to accommodate adverse conditions.
  - .3 Periodically visit and inspect the installation and report unsatisfactory conditions to the Contractor.
- 1.2.2 Installers qualifications: minimum of 5 years experience in the application of products, systems and assemblies specified

#### **1.3 SUBMITTALS**

- 1.3.1 Manufacturers written certification: Acceptability of airseal membrane substrate
- 1.3.2 Samples: Submit the following samples in accordance with Section 01300.
- .1 Airseal membrane minimum 300mm square

### **2. Products**

#### **2.1 PRIMER, MASTIC, AND LIQUID MEMBRANE**

2.1.1 Type as recommended by the airseal membrane manufacturer.

#### **2.2 AIRSEAL MEMBRANE**

- 2.2.1 40 mils thick modified bituminous composite sheet, "Perm-A-Barrier" by W.R. Grace Co. of Canada Ltd.,
- 2.2.2 Blueskin VP 160 self-adhered membrane by Bakor Inc., Henry Building Envelope Systems.

## **AIRSEAL MEMBRANE**

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### **3. Execution**

#### **3.1 INSTALLATION - GENERAL**

- 3.1.1 Provide the airseal membrane in strict accordance with the manufacturer's written instructions and the manufacturer's representative on site instructions.
- 3.1.2 Provide primer, mastic and liquid membrane as recommended by the airseal membrane manufacturer.
- 3.1.3 Co-ordinate the work of other Sections where such work is closely associated with the work of this Section and report any damage done to the work of this Section.
- 3.1.4 Provide complete coverage of and adhesion to substrates to receive the air/vapour barrier membrane, including wall protrusions.
- 3.1.5 Provide the membrane to primed substrate in 8' lengths or as recommended by the membrane manufacturer.
- 3.1.6 Provide membrane so that horizontal joints overlap with the upper sheet over the lower sheet, shingle style. Lap all horizontal joints minimum 2" all side joints minimum 2-1/2" and end joints minimum 6". Stagger vertical joints to avoid four way joints.
- 3.1.7 Provide a trowelled head of mastic to all terminations of the membrane at the end of a day's work and at membrane terminations.
- 3.1.8 Reinforce inside and outside corners with a continuous 12" wide sheet membrane prior to installing the air/vapour barrier.
- 3.1.9 Fill gaps and joints with liquid membrane and reinforce with a continuous 12" wide sheet membrane prior to installing the airseal membrane.
- 3.1.10 Provide liquid membrane at protrusions and difficult detail areas and provide a minimum 2-1/2" overlap with the airseal membrane.
- 3.1.11 Provide airseal membrane so that the exterior wall is air tight, with air tight junctures at openings, penetrations and edges e.g. at plumbing and heating pipes, around exterior and windows, and other protrusions.
- 3.1.12 Install between aluminum framing and adjacent materials, between roof vapour retarders at different levels, between skylights and roof vapour retarder, between new and existing construction and at all other locations required to maintain air/vapour seal.
- 3.1.13 Do not cover the airseal membrane with cavity insulation until it has been inspected.



## **AIRSEAL MEMBRANE**

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- 3.1.14 Repair punctures, rips and tears with pieces of membrane completely adhered to the damaged membrane. Where punctures and tears are extensive, replace entire damaged section.

### **3.2 AIRSEAL TRANSITIONS**

- 3.2.1 Co-ordinate with other Sections to ensure continuity of the barrier.
- 3.2.2 Provide airseal membrane returned minimum 8" into the head, jamb, and sill surfaces of windows doors, and other openings in exterior walls to accommodate continuous and positive airseal transitions. Provide airseal membrane patches at inside corners where it has been cut and folded.

### **3.3 CAVITY FLASHING**

- 3.3.1 Provide airseal membrane as rainscreen cavity flashing to direct water to and out weep holes in the rainscreen. Ensure that cavity flashing is completely and fully supported by a rigid and continuous substrate; do not install airseal membrane cavity flashing over an unsupported cavity or gap.

**END OF SECTION**

## STEEL SIDING

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### PART 1 GENERAL

#### 1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .3 Section 06 10 53 – Miscellaneous Rough Carpentry.
- .4 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .5 Section 07 92 00 - Joint Sealants.

#### 1.2 REFERENCES

- .1 American Society of Mechanical Engineers (ASME)
  - .1 ASME B18.6.3, Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series).
- .2 ASTM International
  - .1 ASTM D2369, Test Method for Volatile Content of Coatings.
  - .2 ASTM D2832, Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
  - .3 ASTM D5116, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .3 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.
  - .2 CAN/CGSB-93.4, Galvanized and Aluminum-Zinc Alloy Coated Steel Siding Soffits and Fascia, Prefinished, Residential.
  - .3 CGSB 93.5, Installation of Metal Residential Siding, Soffits and Fascia.
- .4 Canadian Standards Association (CSA)
  - .1 CSA B111, Wire Nails, Spikes and Staples.

#### 1.3 SUBMITTALS

- .1 Product data: submit manufacturer's printed product literature, specifications and data sheet.
  - .1 Submit two copies of WHMIS SDS - Safety Data. Indicate VOC's for caulking materials during application and curing.

## STEEL SIDING

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- .2 Submit duplicate 300 x 300 mm samples of siding material, of colour and profile specified.
- .3 Shop drawings to indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, soffits, fascia, metal furring, and related work.
- .4 Submit manufacturer's installation instructions.

### 1.4 WARRANTY

- .1 Provide a written guarantee, signed and issued in the name of the owner, covering the metal cladding/siding material for 10 (ten) years and workmanship for a period of two (2) years from the date of Substantial Completion.
- .2 Areas which prove to be defective in any way shall be repaired or replaced and any damage to other work as a result of such defects shall be repaired at no cost to the Owner.

## PART 2 PRODUCTS

### 2.1 STEEL CLADDING AND COMPONENTS

- .1 Strip siding: to CGSB 93.4, Type A vertical, Class plain.
  - .1 Finish coating: silicone modified polyester (SMP) topcoat system.
  - .2 Colour: colour selected by Owner.
  - .3 Gloss:  $30 \pm 5$ .
  - .4 Thickness: 0.65 mm base metal thickness.
  - .5 Profile: preformed interlocking joints, fastener holes prepunched, profile as indicated on drawings.
- .2 Soffit: to CGSB 93.4, class plain
  - .1 Finish coating: silicone modified polyester (SMP) topcoat system.
  - .2 Colour: selected by Owner.
  - .3 Gloss:  $30 \pm 5$ .
  - .4 Thickness: 0.65 mm base metal thickness.
  - .5 Profile: flat sheet "V" crimped for stiffness, vented 0.1m<sup>2</sup> of opening for every 30 m<sup>2</sup> of building area.
- .3 Fascia facings and exposed trim: to CGSB 93.4, Class plain
  - .1 Finish coating: silicone modified polyester (SMP) topcoat system.

## **STEEL SIDING**

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- .2 Colour: colour selected by Owner.
- .3 Gloss:  $30 \pm 5$ .
- .4 Thickness: 0.65 mm base metal thickness.
- .5 Profile: flat sheet "V" crimped for stiffness, preformed with elongated slits and small perforations.

### **2.2 ACCESSORIES**

- .1 Exposed trim: inside corners, outside corners, cap strip, drip cap, undersill trim, starter strip and window/door trim of same material, colour and gloss as cladding, with fastener holes pre-punched.

### **2.3 FASTENERS**

- .1 Nails: to CSA B111. Screws to ASME B18.6.3. Purpose made aluminum alloy stainless steel.

### **2.4 CAULKING**

- .1 Sealants: Section 07 92 00 – Joint Sealants.

### **2.5 SHEATHING MEMBRANE**

- .1 Exterior wall sheathing membrane: to CAN2-51.32, single ply spunbound olefin type coated.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- .1 Install cladding in accordance with CGSB 93.5, and manufacturer's written instructions
- .2 Install one layer exterior wall sheathing membrane horizontally by stapling or nailing lapping edges 150 mm.
- .3 Install continuous starter strips, inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings as indicated.
- .4 Install outside corners, fillers and closure strips with carefully formed and profiled work.
- .5 Install soffit and fascia cladding as indicated.
- .6 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.

## **STEEL SIDING**

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- .7 Attach components in manner not restricting thermal movement.
- .8 Caulk junctions with adjoining work with sealant. Do work in accordance with Section 07 92 00 - Joint Sealants.

### **3.2 CLEANING**

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

## **SHEET METAL ROOFING**

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### **PART 1 GENERAL**

#### **1.1 SECTION INCLUDES**

- .1 Materials and installation for sheet metal roofing including mansard roofs.

#### **1.2 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 45 00 - Quality Control.
- .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Section 07 92 00 - Joint Sealants.

#### **1.3 REFERENCES**

- .1 Aluminum Association (AA).
  - .1 AA DAF-45, Designation System for Aluminum Finishes.
  - .2 AA ASM-35, Specifications for Aluminum Sheet Metal Work in Building Construction, Section 5.
- .2 American Society for Testing and Materials International, (ASTM).
  - .1 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .2 ASTM A792/A792M, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.
  - .3 ASTM D822, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .3 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-37.5, Cutback Asphalt Plastic Cement.
  - .2 CAN/CGSB-93.1, Sheet Aluminum Alloy, Prefinished, Residential.
- .4 Canadian Standards Association (CSA)
  - .1 CSA A123.3, Asphalt Saturated Organic Roofing Felt.
- .5 National Research Council Canada (NRC)/ Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC).
  - .1 CCMC, Registry of Product Evaluations.

## **SHEET METAL ROOFING**

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### **1.4 SUBMITTALS**

- .1 Submit product data sheets for metal roofing, bitumen, roofing, felts, insulation, include:
  - .1 Product characteristics
  - .2 Performance criteria
  - .3 Limitations
- .2 Shop drawings to indicate arrangements of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural frame.
- .3 Submit 300 x 300 mm samples of each sheet metal material.
- .4 Provide manufacturer's instructions to indicate special handling criteria, installation sequence and cleaning procedures.

### **1.5 WARRANTY**

- .1 Provide a written guarantee, signed and issued in the name of the Owner, stating that the metal roofing systems will stay in place and remain watertight for a period of ten (10) years from the date of Substantial Completion of the work. The warranty will be a ten (10) years covering the total costs of repairing any defective materials and workmanship and associated damages.

### **1.6 DESIGN REQUIREMENTS**

- .1 Design, fabricate and install metal roof system to the following requirements:
  - .1 Resist a minimum positive and negative wind pressure of 2 kPa.
  - .2 Maximum deflection 1/240 of clean span under live loads of wind, snow and ice.
  - .3 Calculate snow and ice loads for building area in accordance with National Building Code of Canada.
  - .4 Resist water penetration
  - .5 Allow for thermal movement
  - .6 Resist corrosion
  - .7 Resist loads imposed by the snow retention system.

## **SHEET METAL ROOFING**

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### **PART 2      PRODUCTS**

#### **2.1      SHEET METAL MATERIALS**

- .1 Aluminum-zinc alloy coated steel sheet: to ASTM A792/A792M, commercial quality, with AZ 150 coating, prefinished as specified in 2.2, 0.85 mm base metal thickness.

#### **2.2      PREFINISHED STEEL SHEET**

- .1 VOC content for surface coatings and touch up coatings for prefinished metal sheet maximum 250g/L
- .2 Surface coatings and touch up coatings manufactured or formulated without aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium and their compounds will be acceptable for use on this project.
- .3 Prefinished steel with factory applied polyvinylidene fluoride.
  - .1 Finish coating: silicone modified polyester (SMP) topcoat system.
  - .2 Colour selected by Owner from manufacturer's standard range.
  - .3 Specular gloss: 30 units +/-5 to ASTM D523.
  - .4 Coating thickness: not less than 22 micrometres.
  - .5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20% to ASTM D822 as follows:
    - .1 Outdoor exposure period 2500 hours.
    - .2 Humidity resistance exposure period 5000 hours.
  - .6 Profile as indicated on drawings

#### **2.3      ACCESSORIES**

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Plastic cement: to CAN/CGSB-37.5.
- .3 Underlay: dry sheathing to CAN/CGSB-51.32.
- .4 Slip sheet: reinforced sisal paper or a heavy felt kraft paper.
- .5 Sealant: as per Section 07 92 00 – Joint Sealants.
- .6 Rubber-asphalt sealing compound: to CAN/CGSB-37.29.



## **SHEET METAL ROOFING**

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- .7 Cleats: of same material, and temper as sheet metal, minimum 50mm wide. Thickness same as sheet metal being secured.
- .8 Fasteners: concealed.
- .9 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .10 Touch-up paint: as recommended by sheet metal roofing manufacturer.

### **2.4 FABRICATION**

- .1 Fabricate aluminium sheet metal in accordance with AA ASM-35.
- .2 Form individual pieces in 2400 mm maximum lengths. Make allowances for expansion at joints.
- .3 Hem exposed edges on underside 12 mm, mitre and seal.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Apply minimum 0.2 mm dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.
- .6 Protect metals against oxidization by backpainting with isolation coating where indicated.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- .1 Use concealed fastenings except where approved by Owner before installation.
- .2 Provide underlay under sheet metal roofing. Secure in place and lap joints 100 mm minimum.
- .3 Apply slip sheet over asphalt felt underlay to prevent bonding between sheet metal and felt. Secure with minimum anchorage and lap joints 50 mm minimum in direction of waterflow.
- .4 Install sheet metal roof panels using cleats spaced at 610mm oc.
- .5 Secure cleats with two fasteners each and cover with cleat tabs.
- .6 Align transverse seams in adjacent panels.

## **SHEET METAL ROOFING**

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- .7 Flash roof penetrations with material matching roof panels, and make watertight.
- .8 Form seams in direction of water-flow and make watertight.

### **3.2 FLAT SEAM ROOFING**

- .1 Use 450 x 600 mm rectangular sheets to make flat seam roofing. Notch corners and turn up edges 20 mm.
- .2 Lay sheets with long dimension parallel to eaves.
- .3 Lock cleats into seams and flatten smooth in direction of flow.
- .4 At eaves and gable ends, terminate roofing by hooking over previously installed edge strip.

### **3.3 STANDING SEAM ROOFING**

- .1 Use 0.76 mm thick, 400 mm wide to make roofing with standing seams without straight run of standing seam exceeding 10 m.
- .2 Fold lower end of each pan under 20 mm. Slit fold 25 mm away from corner to form tab where pan turns up to make standing seam. Fold upper end of each pan over 50 mm. Hook 20 mm fold on lower end of upper pan into 50 mm fold on upper end of underlying pan.
- .3 Apply sheet metal roofing beginning at eaves. Loose lock pans to valley flashing and edge strips at eaves and gable rakes.
- .4 Finish standing seams 25 mm high on flat surfaces. Bend up one side edge 40 mm and other 45 mm. Make first fold 6 mm wide single fold and second fold 12 mm wide, providing locked portion of standing seam with 5 plies in thickness. Fold lower ends of seams at eaves over at 45° angle. Terminate standing seams at ridge and hips by turning down in tapered fold.
- .5 Form valleys of sheets not exceeding 3 m in length. Lap joints 150 mm in direction of flow. Extend valley sheet minimum 150 mm under roofing sheets. At valley line, double fold valley and roofing sheets and secure with cleats spaced 450 mm oc.

**END OF SECTION**

## **SHEET METAL FLASHING AND TRIM**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Sheet metal flashing and trim for:
  - .1 Copings, parapet caps, sill, and lintel flashings.
  - .2 Fascias.
  - .3 Through-wall flexible flashings with metal drip edges.
  - .4 Counterflashings over bituminous base flashings.
  - .5 Counterflashings at roof mounted equipment and vent stacks.
  - .6 Downpipe system.

#### **1.3 RELATED SECTIONS**

- .1 Division 05 Section Metal Fabrications: Downpipes and associated items.
- .2 Division 06 Section Miscellaneous Rough Carpentry: Wood blocking, curbing and sheathing applicable to metal flashings.
- .3 Division 07 Section Weather Barriers: Flexible flashings and underlayment material behind metal flashings.
- .4 Division 07 Section for roofing system, including flashing sleeves and collars for mechanical and electrical items protruding through roofing membrane, roof expansion joint assemblies.
- .5 Division 07 Section Joint Sealants.
- .6 Division 07 Sections for various exterior cladding requiring flashing and trim.
- .7 Division 08 Sections Aluminum Entrances and Storefronts: Assemblies requiring flashing and trim.
- .8 Division 05 Section Painting.
- .9 Division 22 -Sections for connections to building's storm drainage piping for downpipe system.
- .10 Division 23 -Sections for roof curbs for mechanical equipment.

## **SHEET METAL FLASHING AND TRIM**

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- .11 Division 26 Section for roof curbs for electrical equipment.

### **1.4 PERFORMANCE REQUIREMENTS**

- .1 General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- .2 Compatibility of Materials: Examine Drawings and materials and products of this Section, including flow of water from areas of incompatible materials, and provide compatibility between different adjoining metals and materials.

### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Flashing Reglets: Coordinate with the work of other Sections for installing flashing reglets.
  - .3 Soffit Framing: Coordinate spacing of soffit framing supports with requirements soffit filler panel assembly requirements.
- .2 Pre-installation Meetings:
  - .1 Convene one week before starting work of this section.
  - .2 Review preparation and installation procedures and coordinating and scheduling required with related work.

### **1.6 SUBMITTALS FOR REVIEW**

- .1 LEED Submittals:
  - .1 Provide product data as required by LEED section.
- .2 Shop Drawings:
  - .1 Indicate material profile, jointing pattern, jointing details, fastening methods, types of reglets, flashings, terminations, and installation details.
  - .2 Compatibility: Indicate materials and methods used to isolate and protect incompatible materials and products, and conformance to performance requirements.

## **SHEET METAL FLASHING AND TRIM**

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**.3 Samples:**

- .1** Submit two samples, 300 x 300 mm in size illustrating typical seam, external corner, internal corner, junction to vertical dissimilar surface, material and finish.
- .2** Include two samples of each type of sheet material illustrating metal finish colour.
- .3** Submit two samples of reglet and flashing system components.
- .4** Submit two samples of downpipe system.

### **1.7 SUBMITTALS FOR INFORMATION**

- .1** Qualification Data: For qualified fabricator and Installer.

### **1.8 CLOSEOUT SUBMITTALS**

- .1** Warranty documentation.

### **1.9 QUALITY ASSURANCE**

- .1** Perform work in accordance with the most stringent details and requirements of the following unless more stringent requirements are specified or indicated:
  - .1** Architectural Sheet Metal Manual of SMACNA (Sheet Metal and Air Conditioning Contractors' National Association).
  - .2** Roofing Practises Manual published by Provincial roofing contractors association.
- .2** Fabricator Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
- .3** Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

### **1.10 DELIVERY, STORAGE, AND PROTECTION**

- .1** Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- .2** Prevent contact with materials which may cause discolouration or staining.

### **1.11 WARRANTY**

- .1** Warrant the work of this Section against failure and defects for 5 years. Failures and defects include surface deterioration or defects affecting sheet metal flashings and trim durability, performance or appearance; water penetration; uplift or displacement from wind or ice; open joints.

## **SHEET METAL FLASHING AND TRIM**

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- .2 Manufacturer's Warranty: Provide a ten year manufacturer's warranty to include repair of finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

### **Part 2 Products**

#### **2.1 MATERIALS – GENERAL**

- .1 Minimum Recycled Content: Provide metal flashing and trim materials with recycled content in conformance with Credit MR 4.
- .2 Regional Materials: Provide metal flashing and trim materials in conformance with Credit MR 5.

#### **2.2 SHEET MATERIALS**

- .1 Aluminum Sheet: ASTM B209M. AA 5005-H14, prefinished.

#### **2.3 METAL FLASHING AND TRIM ACCESSORIES**

- .1 Fasteners: Same material and finish as flashing metal or material compatible with material being fastened with respect to galvanic reaction. Use fasteners designed and sized to withstand design loads in accordance with applicable building code and referenced standards.
- .2 Washers: Of same material and finish as flashing sheet metal with resilient rubber or soft neoprene packings.
- .3 Underlayment: Self-adhesive SBS modified bitumen sheets, including associated materials, as specified for Roof Parapet Cap Flashing in Division 07 Section Weather Barrier.
- .4 Protective Backing Paint: Zinc chromate alkyd.
- .5 Isolation Coating: CAN/CGSB-1.108, alkali-resistant bituminous paint.
- .6 Sealant: Silicone type, as specified in Division 07 Section Joint Sealants.
- .7 Plastic Cement: ASTM D4586, asphalt roofing cement, asbestos free, of type and consistency required for application.
- .8 Reglet and Flashing System: Pre-fabricated, surface mounted and recessed types, galvanized steel, minimum 0.56 mm thick; include flashing, corner pieces, clips and accessories of types as detailed or as required to suit application.

## **SHEET METAL FLASHING AND TRIM**

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- .9 Touch-up Paint: As recommended by sheet material manufacturer.

### **2.4 DOWNPIPE SYSTEM**

- .1 General: Provide shop painted galvanized downpipe system. Fabricate metal components according to Division 05 Section Metal Fabrications.
- .2 Downspouts: Round section steel pipe of size indicated, and with straight lengths to greatest extent possible, unless otherwise indicated.
- .3 Accessories:
  - .1 Downspout Support Brackets: Steel, design acceptable to Consultant, including stainless steel anchors.
  - .2 Pipe Adaptors: Steel, for connecting downpipes to building's storm drainage piping and connecting to steel channel gutters, of design acceptable to Consultant.

### **2.5 FABRICATION**

- .1 Brake form, unless otherwise indicated, flashings, copings, fascias and similar from sheet material as specified and indicated, to profiles indicated, and to SMACNA requirements.
- .2 Shop fabricate items to greatest extent possible. Minimize fabrication in field.
- .3 Form sections true to shape, accurate in size, square, and free from distortion or defects.
- .4 Provide sheet metal flashing and trim items of material thicknesses to suit each application, performance requirements and recommendations of quality referenced quality standard, and not less than the thicknesses specified.
  - .1 Copings, Parapet Caps and Other Horizontal Sheet Items: 2 mm thickness sheet aluminum.
  - .2 Sill Flashings within 1.5 m above grade: 3 mm thickness sheet aluminum.
  - .3 Counterflashings, Fascias and Other Vertical Sheet Items: 0.64 mm thickness sheet aluminum.
  - .4 Increase metal thicknesses or provide additional concealed supports to prevent appearance damage caused by building maintenance activity.
- .5 Fabricate cleats of same material as sheet, continuous, interlockable with sheet.
- .6 Form pieces in single length sheets. Where not practical provide in longest possible lengths.

## **SHEET METAL FLASHING AND TRIM**

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- .7 Hem exposed edges on underside minimum 13 mm; mitre and seam corners.
- .8 Form material with standing seams at internal and external corners; S-lock seams at other location. Lap seams not permitted. Provide caulked standing seams or other acceptable seaming method where thermal induced movement of metal using lock seams will cause deformities and detrimental effects to performance of flashing.
- .9 Fabricate corners from one piece with minimum 450 mm long legs; seam for rigidity, seal with sealant.
- .10 Fabricate vertical faces with bottom edge formed outward 50 mm, unless otherwise indicated, and hemmed to form drip.
- .11 Fabricate flashings to allow toe to extend 50 mm over roofing. Return and brake edges.
- .12 Form sill flashings with dog ears.
- .13 Through-Wall Flashing Sheet with Metal Drip:
  - .1 Provide through-wall flashing specified in Division 08 Section Fluid- Applied Membrane Air Barriers, with laminated exposed metal drip flashing; laminate by acceptable method.
  - .2 Metal Drip:
    - .1 Form from light gauge metallic-coated steel sheet, and as indicated.
    - .2 Exposed Edges: Hemmed.
    - .3 Extend flashing 50 mm into wall construction, unless otherwise indicated.
    - .4 Profile: 45 degrees to wall surface, and projecting not less than 10 mm.

### **2.6 FINISH REQUIREMENTS**

- .1 Factory prepare, pre-treat, and apply coating to exposed metal surfaces to conform to coating and resin manufacturers' written instructions.
- .2 Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- .3 Back paint concealed unpainted metal surfaces with protective backing paint to a minimum dry film thickness of 0.4 mm.
- .4 Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of accepted Samples and are assembled or installed to minimize contrast.
- .5 Aluminum Sheet: Two-coat fluoropolymer, AAMA 620 and AAMA 2605.
  - .1 Unless otherwise specified in Sections requiring flashing and trim, shop pre-coat exposed metal surfaces with thermoset fluoropolymer finish system containing not



## **SHEET METAL FLASHING AND TRIM**

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- less than 70 percent PVDF resin by weight in colour coat.
- .2 Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- .3 Products: Subject to compliance with requirements provide Duranar Sunstorm by PPG, or comparable acceptable coating by one of the following.
  - .1 Akzo Nobel.
  - .2 Valspar.
- .4 Colours: selected from PPG Duranar Sunstorm Mica coatings. Colours provided as indicated in drawings and details.
- .6 Shop Finish for Downpipe System: EXT 5.3D polyurethane finish system as specified in Division 9 Section Painting.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set and correctly located.
- .2 Verify roofing termination and base flashings are in place, sealed, and secure.
- .3 Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- .1 Install starter and edge strips, and cleats before starting installation.

#### **3.3 UNDERLAYMENT INSTALLATION**

- .1 Where roofing membrane sheets are not indicated to be installed under metal flashings, install self-adhering sheet underlayment.
- .2 Install sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures.
- .3 Apply in shingle fashion to shed water, with end laps of not less than 150 mm staggered 600 mm between courses. Overlap side edges not less than 100 mm. Roll laps with roller. Cover underlayment within 14 days.
- .4 Apply manufacturer recommended slip sheet for separating sheet metal from underlayment.

## **SHEET METAL FLASHING AND TRIM**

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### **3.4 SHEET METAL FLASHING AND TRIM INSTALLATION**

- .1 Install flashings and trim to SMACNA requirements including associated drawing details.
- .2 Provide flashing and trim as indicated and as required to seal against weather and to provide finished appearance.
- .3 Apply isolation coating to metal surfaces in contact with dissimilar materials, such as concrete and masonry.
- .4 Secure flashings in place using concealed in-seam or clip fasteners. Use exposed fasteners only where permitted.
  - .1 Do not fasten flashings through top surfaces. Where specific conditions require top fastening, use self-adhering membrane on underside of flashing and colour matched screw fasteners with rubber or neoprene washers; nails are not permitted.
- .5 Apply plastic cement compound between metal flashings and felt flashings.
- .6 Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- .7 Seal metal joints watertight.
- .8 Counterflash bituminous flashings at intersections of roof and vertical surfaces and curbs.
- .9 Install reglets as indicated, true and level with top continuously caulked.
- .10 Insert metal flashing into reglets or under cap flashing as detailed to form a weathertight junction.
  - .1 Turn top edge of flashing into reglets a minimum of 25 mm. Wedge securely into joint and caulk.
- .11 Downpipe System:
  - .1 Securely fasten downspouts. Locate support brackets at locations acceptable to Consultant.
  - .2 Connect downspouts to gutters and building's drainage system piping; tightly seal.

### **3.5 FIELD QUALITY CONTROL**

## **SHEET METAL FLASHING AND TRIM**

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- .1 Provide inspection services in accordance with requirements of, and as part of inspections specified in Division 07 Sections for TPO Roofing, Field Quality Control articles.

### **3.6 CLEANING AND PROTECTION**

- .1 Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- .2 Clean off excess sealants.
- .3 Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- .4 On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.
- .5 Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touch-up or similar minor repair procedures.

**END OF SECTION**

## **FIRE STOPPING AND SMOKE SEALS**

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### **1. General**

#### **1.1 GENERAL REQUIREMENTS**

1.1.1 Conform to requirements of Division 1.

#### **1.2 SUBMITTALS**

1.2.1 **Samples:** Submit the following samples in accordance with **Section 013300**.

.1 minimum 12" square showing actual firestop material proposed for project

1.2.2 **Shop drawings:** Submit the shop drawings in accordance with **Section 013300**. Indicate the following:

.1 material, reinforcement, arrangement and component sizes

.2 method of installation system

.3 method of assembly and anchorage / fastenings

.4 Construction details: accurately reflect actual job conditions.

1.2.3 **Maintenance data:** Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.

### **2. Products**

#### **2.1 FIRE STOPPING AND SMOKE SEAL SYSTEMS**

2.1.1 Provide asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with Standards Council of Canada's requirements of CAN4-S115 in conformance and not to exceed opening sizes for which they are intended. Fire resistance rating of installed fire stopping assembly not less than the fire resistance rating of surrounding floor and wall assembly.

2.1.2 **Service penetration assemblies and components:** Certified by ULC in accordance with CAN4-S115 and listed in ULC Guide No. 40U19, 40U19.13 and 40U19, and in conformance with ULC-S115, Fire Tests of Firestop System.

#### **2.2 MATERIALS AND ACCESSORIES**

2.2.1 **Primers:** To manufacturer's recommendation for specific material, substrate, and end use.

2.2.2 **Water:** Potable, clean and free from injurious amounts of deleterious substances.

2.2.3 **Damming and backup materials, supports and anchoring devices:** To manufacturer's

## **FIRE STOPPING AND SMOKE SEALS**

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recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

### **2.2.4 Sealants for vertical joints: Non-sagging.**

## **3. Execution**

### **3.1 PREPARATION**

3.1.1 Examine sizes and conditions of voids to be filled to establish correct thickness and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

3.1.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

3.1.3 Maintain insulation around pipes and ducts penetrating fire separation.

3.1.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

### **3.2 INSTALLATION**

3.2.1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions. Install around new penetrations through existing fire rated assemblies. Install between underside of metal decking and top of walls as detailed to maintain fire ratings.

3.2.2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

3.2.3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

3.2.4 Tool or trowel exposed surfaces to a neat finish.

3.2.5 Remove excess compound promptly as work progresses and upon completion.

### **3.3 CLEAN UP**

3.3.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

3.3.2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

**FIRE STOPPING AND SMOKE SEALS**

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END OF SECTION

## **JOINT SEALANTS**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Sealant between dissimilar, adjacent materials on the interior and exterior of the building.
- .2 Sealant and joint backing.
- .3 Preparing substrate surfaces.
- .4 Structural sealant for glazing assemblies.
- .5 Acoustic sealants.
- .6 Instructions to complete other Sections containing sealant or caulking specifications.

#### **1.3 RELATED SECTIONS**

- .1 Division 07 Sections Weather Barriers: Sealants required in conjunction with weather barriers.
- .2 Division 07 Section Firestopping: Sealants required in conjunction with firestopping and smoke seals.
- .3 Division 07 Sections for sealants required in conjunction with exterior wall cladding.
- .4 Division 07 Section for sealants required in conjunction with roofing.
- .5 Division 07 Section Sheet Metal Flashing and Trim: Sealants required in conjunction with metal flashings.
- .6 Division 08 Section Hollow Metal Doors and Frames: Sealants required in conjunction with door frames.
- .7 Division 08 Section Aluminum-Framed Entrances and Storefronts: Sealants required in conjunction with storefronts.
- .8 Division 08 Section Glass and Glazing: Sealants required in conjunction with glazing methods.

## **JOINT SEALANTS**

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- .9 Division 09 Section Gypsum Board Assemblies: Sealants required in conjunction with acoustic treatment.

### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Sealant Design: Design structural sealant to withstand specified loads without breakage, loss, failure of seals, product deterioration, and other defects.
- .2 Design installed exterior sealants to withstand the following without breakage, loss, failure of seals, product deterioration, and other defects:
  - .1 Dead loads and live loads caused by positive and negative wind loads acting normal to plane of wall as calculated in accordance with applicable code, or to design pressure specified, as measured in accordance with ASTM E330.
  - .2 Seismic loads and sway displacement as calculated in accordance with applicable code.
  - .3 Movement from ambient temperature range of 100 degrees C.
  - .4 Movement and deflection of structural support framing.
  - .5 Water and air penetration.
  - .6 Dynamic movements in joints for minimum 20 years.
- .3 Design and select sealants to suit applications with applicable:
  - .1 Elongation capability.
  - .2 Material service temperature range.
  - .3 Shore A hardness range.

### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this Section.
  - .2 Coordinate the work with all Sections referencing this Section.
- .2 Pre-installation Conference: Convene three weeks before starting work of this Section.
  - .1 Include parties directly affecting work of this Section, including, firestopping manufacturer's technical representative, installer's job foreman.
  - .2 Review submittals.
  - .3 Review maximum and minimum clearances for joint systems.
  - .4 Review staging and sequencing of work.
  - .5 Record and submit copies of minutes including discussions, decisions, agreements, and disagreements to each party attending and concerned parties not in attendance.



## **JOINT SEALANTS**

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### **1.6 SUBMITTALS FOR REVIEW**

- .1 Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and colour availability.
- .2 Structural Sealant Joint Design: Provide calculations for structural bite, dead load support, glueline thickness, shear, and other parameters. Include confirmation that design data provided by Consultant have been reviewed and approved by sealant manufacturer.
- .3 LEED Submittals:
  - .1 Product Data:
    - .1 Credit EQ 4.1: For products and materials required to conform to low emission requirements.
- .4 Shop Drawings: Indicate sealant joints and dimensions, materials, structural bite, glueline thickness, joint profile, and support framing.
- .5 Samples: Submit two samples for each type and colour of joint sealant required in 13 mm wide joints, formed between two 150 mm long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- .6 Joint-Sealant Schedule: Include the following information:
  - .1 Joint-sealant application, joint location, and designation.
  - .2 Joint-sealant manufacturer and product name.
  - .3 Joint-sealant formulation.
  - .4 Joint-sealant colour.

### **1.7 SUBMITTALS FOR INFORMATION**

- .1 Qualifications Data: For Installer.
- .2 Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
  - .1 Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
  - .2 Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- .3 Installation Data: Manufacturer's special installation requirements.
  - .1 Indicate special procedures, surface preparation, perimeter conditions requiring special attention, and field quality control testing.

## **JOINT SEALANTS**

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- .4 Field reports.

### **1.8 CLOSEOUT SUBMITTALS**

- .1 Maintenance Data: For each type of sealant provide list specifying details of each product, and names of manufacturers, supplier, and installer.

### **1.9 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Extra Stock Materials:
  - .1 Provide four sealed cartridges or packages of each product to Owner.

### **1.10 QUALITY ASSURANCE**

- .1 Perform sealant application work in accordance with ASTM C1193.
- .2 Perform structural sealant application work in accordance with ASTM C1401.
- .3 Perform acoustical sealant application work in accordance with ASTM C919.
- .4 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this Section with minimum five years documented experience.
- .5 Applicator Qualifications: Company specializing in performing the work of this Section with minimum five years documented experience and approved by the manufacturer.

### **1.11 MOCK-UPS**

- .1 Provide mock-up to include sealant joints in conjunction with each type and parts of exterior wall assemblies.
- .2 Construct mock-up with specified sealant types and with other components noted.
- .3 Locate where directed by Consultant.
- .4 Approved mock-ups may remain as part of the Work.

### **1.12 ENVIRONMENTAL REQUIREMENTS**

- .1 Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

### **1.13 WARRANTY**

- .1 Provide a five year warranty to include coverage for failure to meet specified

## **JOINT SEALANTS**

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requirements.

- .2 Warranty: Include coverage for installed sealants and accessories which fail to achieve air tight seal, water tight seal, and exhibit loss of adhesion or cohesion, or do not cure.
- .3 Provide manufacturer's twenty year material warranty for installed silicone sealant.

### **Part 2 Products**

#### **2.1 MATERIALS - GENERAL**

- .1 Maximum VOC Content: Provide interior sealants with maximum VOC content in conformance with Credit EQ 4.1.
- .2 Use materials with unexpired shelf life.
- .3 Use materials compatible with installation conditions.

#### **2.2 INTERIOR SEALANTS**

- .1 Non-Traffic Locations:
  - .1 Silicone Sealant: Single component, conforming to ASTM C920 Type S, Grade NS, use NT.
  - .2 Subject to compliance with requirements provide Spectrem 3 by Tremco, or comparable product from one of the following:
    - .1 756 SMS or 795 by Dow Corning Corporation, model as recommended by manufacturer for application indicated.
    - .2 Silpruf NB by GE Construction Sealants.
    - .3 Spectrem 3 by Tremco Inc.
- .2 Non-Traffic Locations requiring Paintable Sealant:
  - .1 Paintable Siliconized Acrylic Latex: ASTM C834, Type OP Grade; single component, non-sagging, non-staining, non-bleeding; colour as selected.
    - .1 AC-20 by Pecora Corporation.
    - .2 Sonolac by BASF Construction Chemicals, LLC, Building Systems.
    - .3 Tremflex 834 by Tremco Inc.
- .3 Traffic Locations: Horizontal joints in concrete floors.
  - .1 Polyurethane Sealant: Multi component, conforming to ASTM C920, Type M, Grade P, class 25, Use T.

## JOINT SEALANTS

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- .2 Subject to compliance with requirements provide one of the following products:
  - .1 THC 900 by Tremco Inc.
  - .2 Sonolastic Paving Joint Sealant by BASF Construction Chemicals, LLC, Building Systems.
  - .3 Urexpan NR-200 by Pecora Corporation.
- .4 Joints in Ceramic Tile and Other Hard Surfaces, and including those in Toilet Rooms and Around Plumbing Fixtures:
  - .1 Silicone Sealant (Type O): ASTM C920, Type S, Grade NS, Class 25, Uses NT; G and O, single component, non-sagging, non-staining, mildew resistant; formulated with fungicide; colour as selected by Consultant.
    - .1 786 by Dow Corning Corporation.
    - .2 SCS1700 Sanitary by GE Construction Sealants.
    - .3 Tremsil 200 by Tremco Inc.
- .5 Acoustic Sealant: CAN/CGSB 19.21 or ASTM C834, synthetic rubber, acoustic grade, single component, solvent release, non-skinning, non-sagging, non-hardening, black colour.
  - .1 Products: Subject to compliance with requirements provide one of the following products:
    - .1 CP 506 Smoke and Acoustic Sealant by Hilti.
    - .2 Tremco Acoustical Sealant by Tremco Inc.
    - .3 AC-20 FTR or AIS-919 by Pecora Corporation, model as recommended by manufacturer for application indicated.

## 2.3 EXTERIOR SEALANTS

- .1 Exterior Joints to Perimeters of Openings:
  - .1 Silicone Sealant: ASTM C920, Type S, Grade NS Class 100/50, for Use NT.; single component, neutral curing, non-sagging type; colour as selected.
  - .2 Products: Subject to compliance with requirements provide one of the following products:
    - .1 790 by Dow Corning Corporation.
    - .2 SilPruf LM SCS2700 by GE Construction Sealants.
    - .3 Spectrem 1 by Tremco Inc.
- .2 Traffic Locations: Horizontal expansion joints in concrete walks, balconies and pavements.
  - .1 Polyurethane Sealant: Single component, self levelling, conforming to ASTM C920, Type S Grade P, Use T, class 25.
  - .2 Products: Subject to compliance with requirements provide one of the following

## **JOINT SEALANTS**

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products:

- .1 Sikaflex 1CSL by Sika Canada Inc.
- .2 Sonolastic SL-1 by BASF Construction Chemicals, LLC, Building Systems.
- .3 Urexpan NR-200 by Pecora Corporation.

### **2.4 STRUCTURAL SEALANT**

- .1 Structural Silicone Sealant: ASTM C 920, Type S, Grade NS, Class 25; non-sagging, non-staining, fungus-resistant, non-bleeding, neutral curing; VOC content less than 100 g/L; compatible with system components; colour as selected by Consultant, unless otherwise specified.
  - .1 Products: Subject to compliance with requirements, provide one of the following:
    - .1 799 by Dow Corning Corporation.
    - .2 UltraGlaze SSG4000 or UltraGlaze SSG4000AC by GE Construction Sealants, model as recommended by manufacturer for application indicated, unless otherwise specified.
    - .3 Proglaze SSG by Tremco Inc.

### **2.5 ACCESSORIES**

- .1 Primer: Non-staining type, material recommended by sealant manufacturer to suit application, where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests..
- .2 Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- .3 Joint Backing: ASTM C1330; Type C, round, closed cell material with surface skin, of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Use type as recommended by sealant manufacturer.
  - .1 Neoprene or butyl rubber round solid rod with Shore A hardness of 70.
  - .2 Polyvinyl chloride or neoprene extruded tubing with minimum 6 mm thick walls.
  - .3 Extruded polyolefin, polyethylene, urethane, neoprene or vinyl foam rod with Shore A hardness of 20 and tensile strength of 140 to 200 kPa.
- .4 Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint.
- .5 Masking tape: Non-staining, non-absorbent type compatible with sealant and adjacent surfaces.

## **JOINT SEALANTS**

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### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verify that substrate surfaces and joint openings are clean, dry, and free of frost and ready to receive work.
- .2 Verify that joint backing and release tapes are compatible with sealant.
- .3 Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- .1 Remove loose materials and foreign matter which might impair adhesion of sealant.
- .2 Clean and prime joints in accordance with sealant manufacturer's written instructions.
- .3 Perform preparation in accordance with sealant manufacturer's written instructions supplemented by requirements of ASTM C1193 for solvent release and latex base sealants.
- .4 Protect elements surrounding the work of this Section from damage or disfiguration.

#### **3.3 INSTALLATION**

- .1 Perform installation in accordance with ASTM C1193 for solvent release and latex base sealants and, with ASTM C919 for acoustical sealants.
- .2 Measure joint dimensions and size materials to achieve 2:1 width/depth ratios.
- .3 Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.
  - .1 Horizontal Joints in Paving: Use closed cell polyethylene foam rod, except where joint filler is specified.
  - .2 Vertical Joints: Use closed cell polyethylene foam or soft rod skinned-open-cell polyethylene foam.
- .4 Install bond breaker where joint backing is not used.
- .5 Install sealant free of air pockets, foreign embedded matter, ridges, sags, cracks, loss of adhesion, shrinking, runs, and stains.
- .6 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

## **JOINT SEALANTS**

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- .7 Tool joints concave unless otherwise indicated.

### **3.4 STRUCTURAL SEALANT INSTALLATION**

- .1 Site or factory install glass panels as specified in related Division 08 Sections, and in accordance with ASTM C1401. Maintain required glueline thickness and minimum structural bites.
  - .1 Fill joint with standard sealant application procedures, install backer rod or bond breaker tape to avoid three-sided sealant adhesion.
- .2 Prepare substrates and apply silicone sealant in accordance with manufacturer's written instructions and reviewed shop drawings.
- .3 Bond glass to metal support members with structural silicone sealant using 2-sided method as detailed on drawings.
- .4 Install sealant without gaps, twisting, stretching, or puncturing backing material. Ensure uniform depth to achieve correct profile, coverage, and performance.
- .5 Use temporary glass supports to retain glass panels while sealant is applied and allowed to cure.
- .6 Provide concave, smooth, uniform, sealant finish. Eliminate air pockets and ensure complete contact on both sides of joint opening.

### **3.5 FIELD QUALITY CONTROL**

- .1 Owner will engage qualified independent testing agency to perform tests on joint sealants.
- .2 Joint Sealants: Perform adhesion tests on exterior sealants in accordance with manufacturer's written instructions and ASTM C1193, Method A – Field- Applied Sealant Joint Hand Pull Tab.
  - .1 Perform test no later than 21 days after installation at a rate of one test every 10 m of installed sealant.
- .3 Structural Sealant: Perform adhesion tests on exterior sealants in accordance with manufacturer's written instructions and ASTM C1401, Method B – Hand-Pull Tab (Nondestructive).
  - .1 Perform five tests for first 10 m of applied silicone sealant and one test for each 20 m seal thereafter or perform one test per floor per building elevation minimum.
  - .2 For sealant applied between dissimilar materials, test both sides of joint.
- .4 Indoor Air Quality: Administer testing in occupied areas, as specified in Division 01 Section Temporary Indoor Air Quality Control.
- .5 Remove sealants failing adhesion test, clean substrates, reinstall sealants and perform

## **JOINT SEALANTS**

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retesting.

- .6 Maintain test log and submit report to Consultant indicating tests, locations, dates, results, and remedial actions.
- .7 Maintain record of conditions and temperatures during application.

### **3.6 MANUFACTURER'S FIELD SERVICES**

- .1 Sealant manufacturer to provide field surveillance of the installation of their Products.
- .2 Monitor and report installation procedures and unacceptable conditions.

### **3.7 CLEANING**

- .1 Clean installed work.
- .2 Clean adjacent soiled surfaces.

### **3.8 PROTECTION OF FINISHED WORK**

- .1 Protect installed work.
- .2 Remove masking tape and excess sealant.
- .3 Protect sealants until cured, remove temporary glass supports.

**END OF SECTION**



8

## **HOLLOW METAL DOORS AND FRAMES**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Interior and exterior non-fire rated, steel doors and frames, and associated panels.
- .2 Interior glazed light frames.

#### **1.3 RELATED SECTIONS**

- .1 Division 08 Section Door Hardware: Hardware, silencers, and weatherstripping.
- .2 Division 08 Section Glass and Glazing.
- .3 Division 09 Section Painting: Field painting of doors and frames.

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 System Design: Design and size components to withstand seismic loads in accordance with applicable code.

#### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination:
  - .1 Coordinate with other work having a direct bearing on work of this section.
  - .2 Coordinate the work with frame opening construction, door, and hardware installation.
- .2 Sequencing: Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

#### **1.6 SUBMITTALS FOR REVIEW**

- .1 Product Data: Indicate door and frame configurations and finishes, location of cut-outs for hardware reinforcement.
- .2 LEED Submittals:
  - .1 Product Data:
    - .1 Credit MR 4: For products having recycled content.

## **HOLLOW METAL DOORS AND FRAMES**

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**.3 Shop Drawings:**

- .1** Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.
- .2** Indicate door elevations, internal reinforcement, closure method, and cut-outs for glazing, and finishes.
- .3** Show design data indicating compliance with seismic requirements.

**1.7 SUBMITTALS FOR INFORMATION**

- .1** Manufacturer's Installation Instructions: Indicate special installation instructions.
- .2** Manufacturer's Certificate: Certify that Products meet or exceed specified requirements. .

**1.8 CLOSEOUT SUBMITTALS**

- .1** Warranty documentation.

**1.9 QUALITY ASSURANCE**

- .1** Perform work to requirements of CSDMA (Canadian Steel Door Manufacturers Association) applicable publications.

**1.10 DELIVERY, STORAGE, AND PROTECTION**

- .1** Remove doors and frames from wrappings or coverings upon receipt on site and inspect for damage.
- .2** Store in vertical position, spaced with blocking to permit air circulation between components.
- .3** Store materials on planks or dunnage, out of water and covered to protect from damage.
- .4** Clean and touch up scratches or disfigurement caused by shipping or handling with zinc-rich primer.

**Part 2 Products**

**2.1 MATERIALS – GENERAL**

- .1** Minimum Recycled Content: Provide steel products with 80 percent recycled content in conformance with Credit MR 4.

**2.2 MANUFACTURERS**

- .1** Subject to conformance to requirements provide DW Series hollow metal doors and

## **HOLLOW METAL DOORS AND FRAMES**

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frames manufactured by one of the following

- .1 Greensteel Industries Ltd
- .2 Fleming Door Products; an Assa Abloy Group company.
- .3 Shanahan's.
- .4 Steelcraft; an Ingersoll-Rand company.

### **2.3 MATERIALS**

- .1 Sheet Steel: Galvanized steel to ASTM A653/A653M, commercial grade (CS), Type B, coating designation 180ZF for exterior doors and frames; coating designation 120ZF for interior doors and frames.
- .2 Reinforcement Channel: To CSA G40.20/G40.21, Type 300W; coating designation to ASTM A653/A653M, 75ZF.

### **2.4 DOOR CORE MATERIALS**

- .1 Honeycomb Core: Structural small cell 25 mm maximum, kraft paper honeycomb, sanded to required thickness.
- .2 Polyisocyanurate Core: CAN/ULC-S704 or ASTM C1289, rigid polyisocyanurate, closed cell board, of density required to comply with performance requirements.

### **2.5 ADHESIVES**

- .1 Cores and Steel Components: Heat resistant, structural reinforced epoxy, resin based adhesive.
- .2 Lock Seam: Reinforced epoxy resin, high viscosity, thixotropic sealant.

### **2.6 PRIMERS**

- .1 Rust inhibitive touch-up only.

### **2.7 ACCESSORIES**

- .1 Door Silencers: Single stud rubber/neoprene.
- .2 Exterior Top Caps: Rigid polyvinylchloride extrusion conforming to CGSB- 41-GP-19MA.
- .3 Removable Glazing Stops: Formed galvanized steel channel, minimum 16 mm high, accurately fitted, butted at corners and fastened to frame sections with counter-sunk tamper proof sheet metal screws.

## **HOLLOW METAL DOORS AND FRAMES**

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- .4 Weatherstripping: Specified in Division 08 Section Door Hardware.
- .5 Bituminous Coating: Fibred asphalt emulsion.
- .6 Glass and Glazing Materials: As specified in Division 08 Section Glass and Glazing, minimum 6 mm thick.

### **2.8 FABRICATION - DOORS**

- .1 Exterior Doors: Both face sheets 1.2 mm steel, with welded stiffener construction, polyisocyanurate core laminated under pressure to face sheets.
  - .1 Thermal Resistance Value (R-value): Not less than 2.5 when tested according to ASTM C1363.
- .2 Interior Doors: Both face sheets 1.2 mm steel with welded stiffener construction, honeycomb core laminated under pressure to face sheets.
- .3 Laminate vertical steel stiffeners to each face sheet at 150 mm o.c. maximum.
- .4 Longitudinal Edges: Mechanically interlocked and epoxy-sealed with no visible edge seams.
- .5 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.
- .6 Reinforce for surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware.
- .7 Top and Bottom Channels: Inverted, recessed, welded steel channels and flush steel top and bottom caps.
- .8 Exterior Door: Flush PVC top caps.
- .9 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

### **2.9 FABRICATION – FRAMES**

- .1 Exterior and Interior Frames for Doors and Lights: 1.2 mm thick base metal thickness, welded construction.
- .2 Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.
- .3 Mortise, blank, reinforce, drill and tap for templated hardware, in accordance with templates provided by hardware supplier.
- .4 Reinforce frames wider than 1200 mm with roll formed steel channels fitted tightly into frame head, flush with top.
- .5 Terminate door stops 150 mm above finished floor. Cut stop at 45 degree angle and close.
- .6 Prepare frames for silencers. Provide three single silencers for single doors on strike side. Provide two single silencers on frame head at double doors without mullions.

## **HOLLOW METAL DOORS AND FRAMES**

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- Part 3**      .7      Configure exterior frames with special profile to receive recessed weatherstripping.  
Execution

## **HOLLOW METAL DOORS AND FRAMES**

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### **3.1 EXAMINATION**

- .1 Verify that opening sizes and tolerances are acceptable; check floor area within path of door swing for flatness.
- .2 Verify doors and frames are correct size, swing, rating and opening number.
- .3 Remove temporary shipping spreaders.
- .4 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- .1 Install doors and frames to CSDMA.
- .2 Coordinate with type of adjacent wall construction for anchor placement.
- .3 Coordinate installation of glass and glazing.
- .4 Coordinate installation of doors and frames with installation of hardware specified in Division 08 Section Door Hardware.
- .5 Set frames plumb, square, level and at correct elevation.
- .6 Secure anchorages and connections to adjacent construction.
- .7 Brace frames rigidly in position while building-in. Install wood spreaders at third points of frame rebate height to maintain frame width. Provide vertical support at centre of head for openings exceeding 1200 mm in width.
- .8 Remove wood spreaders after frames have been built-in.
- .9 Make allowance for deflection to ensure structural loads are not transmitted to frame product.
- .10 Install doors, and hardware in accordance with hardware templates and manufacturer's instructions.
- .11 Adjust operable parts for correct clearances and function.
- .12 Install glazing and door silencers.
- .13 Finish paint as specified in Division 09 Section Painting.
- .14 Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

### **3.3 ERECTION TOLERANCES**

- .1 Maximum Diagonal Distortion: 1.5 mm measured with straight edges, crossed corner to corner.

**END OF SECTION**

## **ACCESS DOORS AND FRAMES**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Non-fire rated wall access door and frame units for access to equipment or spaces where similar items are not specified in plumbing, mechanical, and electrical Sections.

#### **1.3 RELATED SECTIONS**

- .1 Division 09 Section Gypsum Board Assemblies: Openings in partitions.
- .2 Division 09 Section Painting: Field paint finish.
- .3 Division 22 Plumbing: Access doors and frames to plumbing components requiring access.
- .4 Division 23 Mechanical: Access doors and frames to mechanical components requiring access.
- .5 Division 26 Electrical: Access doors and frames to electrical components requiring access.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Coordinate with other work having a direct bearing on work of this section.
  - .1 Coordinate the work with other work requiring access doors.
  - .2 Coordinate location of services to be accessed in advance to allow correct placement of access panels.

#### **1.5 SUBMITTALS FOR REVIEW**

- .1 Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- .2 LEED Submittals:
  - .1 Product Data:
    - .1 Credit MR 4: For products having recycled content.



## **ACCESS DOORS AND FRAMES**

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### **Part 2 Products**

#### **2.1 MATERIALS – GENERAL**

- .1 Minimum Recycled Content: Provide steel products with recycled content in conformance with Credit MR 4.

#### **2.2 MANUFACTURERS**

- .1 Subject to compliance with requirements provide products of one of the following manufacturers:
  - .1 Maxam Metal Products.
  - .2 Acudor Products, Inc.
  - .3 Milcor Inc.
  - .4 Nystrom Inc.

#### **2.3 WALL ACCESS UNITS**

- .1 Non-Fire Rated Metal Access Door and Frame Unit – Flush, Gypsum Board Construction:
  - .1 Frame: 1.6 mm thick.
  - .2 Door Panel: Minimum 1.9 mm thick. Integral attachment flange and drywall bead for flush installation.
  - .3 Hinges: Fully concealed pin type, or continuous piano type, 175 degree opening.
  - .4 Latch: Ring turn latch.
  - .5 Sizes: 300 mm square for single valves, for hand access; 400 mm square for groups of valves; 600 mm square for body access.
  - .6 Style: To match Milcor Style DW.
  - .7 Finish: Manufacturer's standard alkyd baked on primer.
- .2 Fire Rated Metal Wall Access Door and Frame Unit – Flush, Insulated, Gypsum Board Construction:
  - .1 Frame: 1.6 mm thick.
  - .2 Door Panel: Minimum 1.02 mm thick welded pan door panel insulated with non-combustible filler; self-closing, self-latching, with interior latch release.
  - .3 Hinges: Fully concealed pin type, or continuous piano, 175 degree opening.
  - .4 Latch: Ring turn latch.
  - .5 Rating: According to rating of adjoining partition.
  - .6 Sizes: 300 mm square for single valves, for hand access; 400 mm square for groups of valves; 600 mm square for body access.
  - .7 Style: To match Milcor Style DW.

## **ACCESS DOORS AND FRAMES**

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- .8 Finish: Manufacturer's standard alkyd baked on primer.

### **2.4 CEILING ACCESS UNITS – SERVICE AREAS**

- .1 Fire Rated Metal Ceiling Access Door and Frame Unit – Flush, Insulated, Gypsum Board Construction:
  - .1 Frame: 1.6 mm thick.
  - .2 Door Panel: Minimum 1.02 mm thick welded pan door panel insulated with non-combustible filler; self-closing, self-latching, with interior latch release.
  - .3 Hinges: Fully concealed pin type, or continuous piano, 175 degree opening.
  - .4 Latch: Ring turn latch.
  - .5 Rating: According to rating of adjoining partition.
  - .6 Sizes: 300 mm square for single valves, for hand access; 400 mm square for groups of valves; 600 mm square for body access.
  - .7 Style: Milcor Style ATR.
  - .8 Finish: Manufacturer's standard alkyd baked on primer.
- .2 Non-Rated Metal Ceiling Access Door and Frame Unit: - Flush, Gypsum Board Construction:
  - .1 Frame: 1.6 mm thick.
  - .2 Door Panel: Minimum 1.9 mm thick. Integral attachment flange and drywall bead for flush installation.
  - .3 Hinges: Fully concealed pin type, or continuous piano, 175 degree opening.
  - .4 Hardware: Screwdriver slot, quarter turn cam rock for interior locations.
  - .5 Sizes: 300 mm square for single valves, for hand access; 400 mm square for groups of valves; 600 mm square for body access.
  - .6 Finish: Manufacturer's standard alkyd baked on primer.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verify that rough openings for access doors and frames are correctly sized and located.
- .2 Verify and coordinate locations with Consultant prior to installation.
- .3 Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION**

- .1 Install units to manufacturer instructions.

## **ACCESS DOORS AND FRAMES**

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- .2 Install frames plumb and level in opening. Secure rigidly in place.
- .3 Where more than one panel occurs on the same wall or ceiling surface, align and uniformly space units.
- .4 Position unit to provide convenient access to concealed work requiring access.
- .5 Adjust units for smooth operation.

**END OF SECTION**

## **SLIDING AUTOMATIC ENTRANCES**

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### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- 1. This section includes the following types of automatic entrance doors:**
  1. Exterior and interior sliding automatic entrances.
- 2. Related Sections:**
  1. Division 7 Sections for caulking to the extent not specified in this section.
  2. Division 8 Section "Aluminum-Framed Entrances and Storefronts" for entrances furnished separately in Division 8 Section.
  3. Division 8 Section "Glazing" for materials and installation requirements of glazing for automatic entrance doors.
  4. Division 26 and 28 Sections for electrical connections including conduit and wiring for automatic entrance door operators and access control devices.

#### **1.2 REFERENCES**

- 1. References: Refer to the version year adopted by the Authority Having Jurisdiction.**
  1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
  2. ICC/IBC - International Building Code.
  3. CUL - Approved for use in Canada.
  4. NFPA 70 - National Electrical Code.
  5. NFPA 101 - Life Safety Code.
- 2. American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA).**
  1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
  2. ANSI Z97.1 Standards for Safety Glazing Material Used in Buildings.
- 3. Underwriters Laboratories (UL).**
  1. UL 325 Standard for Safety for Door, Drapery, Gate, Louver and Window Operators and Systems.
- 4. Canadian Standards Association (CSA).**
  1. CAN/CSA-C22.2 No. 247 - Operators and Systems of Doors, Gates, Draperies, and Louvers.
- 5. American Association of Automatic Door Manufacturers (AAADM).**

## **SLIDING AUTOMATIC ENTRANCES**

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- 6. American Society for Testing and Materials (ASTM).**
  1. ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
  2. ASTM B209 Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.
- 7. American Architectural Manufacturers Association (AAMA).**
  1. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.
- 8. National Association of Architectural Metal Manufacturers (NAAMM).**
  1. Metal Finishes Manual for Architectural Metal Products.

### **1.3 DEFINITIONS**

- 1. Activation Device:** Device that, when actuated, sends an electrical signal to the door operator to activate the operation of the door.
  1. Knowing act: Consciously initiating the opening of a power operated door using acceptable methods including wall mounted switches such as push plates and controlled access devices such as keypads, card readers and key switches.
- 2. Safety Device:** A device that detects the presence of an object or person within a zone where contact could occur and provides a signal to stop the movement of the door.

### **1.4 PERFORMANCE REQUIREMENTS**

- 1. Compliance with the following:**
  1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
  2. UL 325 listed.
- 2. Automatic door equipment accommodates medium to heavy pedestrian traffic.**
- 3. Entrapment Force Requirements:**
  1. Power Operated Sliding Doors: Not more than 30 lbf (133 N) required to prevent stopped door from closing.
  2. Sliding doors provided with a breakaway device shall require no more than 50 lbf (222N) applied 1 inch (25 mm) from the leading edge of the lock stile for the breakout panel to open.

## **SLIDING AUTOMATIC ENTRANCES**

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### **1.5 SUBMITTALS**

1. **Product Data:** Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, fabrication, operational descriptions and finishes.
2. **Shop Drawings:** Submit manufacturer's shop drawings, including elevations, sections and details, indicating dimensions, materials, and fabrication of doors, frames, sidelites, operator, motion /presence sensor control device, anchors, hardware, finish, options and accessories.
3. **Samples:** Submit manufacturer's samples of aluminum finish.
4. **Informational Submittals:** Manufacturer's product information and applicable sustainability program credits that are available to contribute towards a LEED rated project certification.
  1. Credit MR 4.1 and 4.2: Manufacturer's or fabricator's certificate indicating percentage of post-consumer recycled content by weight and pre-consumer recycled content by weight for each Product specified under this Section.
5. **Manufacturers Field Reports:** Submit manufacturer's field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA A156.10 after completion of installation.
6. **Operating and Maintenance Manuals:** Provide manufacturers operating and maintenance manuals for each item comprising the complete door opening installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the entrance and their nearest service representatives. The final copies delivered after completion of the installation test to include spare parts list.
7. **Warranties and Maintenance:** Special warranties and maintenance agreements specified in this Section.

### **1.6 QUALITY ASSURANCE**

1. **Manufacturers Qualifications:** Engage qualified manufacturers with a minimum 10 years of documented experience in manufacturing of doors and equipment of similar to that indicated for this Project and that have a proven record of successful in-service performance. Manufacturer to have a company certificate issued by AAADM.
2. **Installer Qualifications:** Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing and maintenance of units similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

## **SLIDING AUTOMATIC ENTRANCES**

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3. **Certified Inspector Qualifications:** Certified by AAADM.
4. **Source Limitations for Automatic Entrances:** Obtain each type of door, frame, operator and sensor components specified in this Section from a single source, same manufacturer unless otherwise indicated.
5. **Power-Operated Pedestrian Door Standard:** ANSI/BHMA A156.10 (current version).
6. **Emergency Exit door requirements:** Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress.

### **1.7 PROJECT CONDITIONS**

1. **Field Measurements:** Verify actual dimensions of openings to receive automatic entrances by field measurements before fabrication and indicate on shop drawings.

### **1.8 COORDINATION**

1. **Coordinate sizes and locations of recesses in concrete floors for recessed tracks and thresholds if applicable.** Concrete work is specified in Division 03.
2. **Electrical System Roughing-in:** Coordinate layout and installation of automatic entrances with connections to power supplies and access control system as applicable.

### **1.9 WARRANTY**

1. **General Warranty:** Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
2. **Automatic Entrance Doors** shall be free of defects in material and workmanship for a period of One (1) year from the date of substantial completion.
3. **During the warranty period** a factory-trained technician shall perform service and affect repairs. An inspection shall be performed after each adjustment or repair.
4. **During the warranty period** all warranty work, including but not limited to emergency service, shall be performed during normal business hours.
5. **Manufacturer** shall have in place a dispatch procedure that shall be available 24 hours a Day, 7 Days a week for emergency call back service.

## SLIDING AUTOMATIC ENTRANCES

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### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

1. **Manufacturer:** ASSA ABLOY Entrance Systems, Website [www.assaabloyentrance.ca](http://www.assaabloyentrance.ca)  
**contact:** [charlie.potvin@assaabloy.com](mailto:charlie.potvin@assaabloy.com)

**Substitutions:** Requests for substitution and product approval in compliance with the specifications must be submitted in writing and in accordance with the procedures outlined in Division 1, Section "Substitution Procedures". Approval of requests is at the discretion of the architect, owner, and their designated consultants.

#### 2.2 SLIDING AUTOMATIC ENTRANCES

1. **Sliding automatic entrance system including the following:**
  1. Sliding panels, sidelites and aluminum frame.
  2. Overhead concealed, electro-mechanical operator.
  3. Operator housing, guide system and carrier assemblies.
  4. Controls and accessories as required for a complete installation.
2. **ASSA ABLOY SL500 Automatic Sliding Entrance with Stile and Rail Panels (Basis of Design):**
  1. Bi-parting, full breakout, door system.
    - a. Configuration: Bi-parting, four equal panel unit with two operable leaves and two sidelites.
    - b. Traffic Pattern: Two-way.
    - c. Emergency Breakaway Capability: Sliding leaves and sidelites.
    - d. Mounting: Overhead header installed between jambs.

#### 2.3 ENTRANCE COMPONENTS

1. **Stile and Rail Sliding Panels and Sidelites:**
  1. Material: Extruded Aluminum, Alloy 6063-T5.
  2. Door panels shall have a minimum .125 inch (3.2 mm) structural wall thickness including adjoining horizontal members and perimeter frames where applicable.
  3. Door Construction shall be by means of an integrated corner block with 3/8 inch all-thread through bolt from each stile.
  4. Glass stops shall be .062 inch (15.8 mm) wall thickness and shall provide security function as a standard by means of a fixed non-removable exterior section with glazing to be performed from the interior only.
  5. Full breakout sliding entrances shall include two interlocks per moving panel securing the leading stile of the sidelite and the butt stile of the sliding door panel together.



## **SLIDING AUTOMATIC ENTRANCES**

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6. Vertical Stiles shall be medium stile 4 inch (102 mm).
  7. Bottom Rails shall be 7 inch (178 mm).
  8. Intermediate Muntin shall be 4 inch (102 mm).
  9. Weather-Stripping: Slide-in type, replaceable pile mohair seals retained by the aluminum extrusions. The following types of weather-stripping are required: complementing weather-stripping on the joining vertical stiles of the sidelite and sliding door panels, complementing weather-stripping on the lead edge of the lock stiles of bi-parting doors, single pile weather-stripping between the carrier and the header, single pile weather-stripping on the lead edge stile of single slide door panels, dual pile weather-stripping on the pivot stile of breakout sidelite panels, and dual pile weather-stripping on the butt stile of fixed sidelite panels. Bottom rails shall be provided with an adjustable nylon sweep.
  10. Glass: Glazing shall comply with ANSI Z97.1, thickness as indicated.
    - a. Glazing Sliding Panels and Sidelite Panels: 1" (25 mm) clear insulated glass with tempered panes.
    - b. Glazing Installation: See Division 8 Section "Glazing" for requirements.
- 
2. **Door Carriers: Manufacturer's standard carrier assembly that allows vertical adjustment.**
    1. Carriage Assembly: Carriage bar with two wheel assemblies. Each assembly shall have tandem roller wheels.
    2. Roller Wheels: Two heavy duty Delrin roller wheels per wheel assembly, for a total of four (4) roller wheels, 1-7/16 inch (36.51 mm) diameter, per active door leaf for operation over a replaceable aluminum track. Single journal with sealed oil impregnated bearings.
    3. Two (2) heavy duty self-aligning anti-risers per leaf.
  3. **Framing Members: Provide automatic entrances as complete assemblies. Manufacturer's standard extruded aluminum framing reinforced as required to support loads.**
    1. Vertical Jamb: 1-3/4 inches (44.5 mm) by 4-1/2 inches (114.3 mm).
  4. **Header: Manufacturer's standard extruded aluminum header with a replaceable aluminum track extending full width of entrance unit. Header to conceal door operators, carrier assemblies, and roller track; complete with hinged access panel for service of door operator, and controls.**
    1. Header Span: Maximum 16'-0" (4.9 m) without intermediate supports when entrance glazed with 1/4-inch glass.
      - a. Capacity: Capable of supporting active breakout leafs up to maximum of 300 lb (136 kg) per leaf when header is supported per manufacturer's recommendations.
    2. Header Size: 4-1/2 inches (114.3 mm) wide by 7 inches (177.8 mm) high.
      - a. Header height including the sensor plate cap which spans the clear door opening width is 8 inches (203.2 mm) high.

## **SLIDING AUTOMATIC ENTRANCES**

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3. Header Access: Continuous hinge at top of header allows cover to swing and allow complete access to operator and internal electronic and mechanical assemblies.
4. Design: Closed header when doors in closed position.

### **2.4 HARDWARE**

1. **Hardware: Provide manufacturer's standard hardware as required for operation indicated.**
  1. Breakaway arms and bottom pivot assemblies shall be supplied by the manufacturer and shall be adjustable to comply with applicable codes.
  2. Hydraulic closer(s) to return breakout door and sidelite panels to the closed position.
    - a. Magnetic catch(s) to retain breakout door and sidelite panels in the closed position.
  3. Bottom ball detent on breakout sidelite panels to provide additional wind resistance.
  4. Locking hardware shall be provided as indicated.
    - a. Electrified slide lock shall automatically lock the sliding function of all sliding door panels within the entrance when the door panels are in the closed position.
      - 1) Fail secure operation: Slide lock shall lock the sliding function of the door panels upon loss of power.
      - 2) Exterior jamb mounted key switch to unlock sliding door operation.
    - b. Exit devices shall lock the breakout function while allowing emergency egress at all times. Exit devices in combination with the automatic slide locking hardware to be provided on secured doors. Automatic locking for the sliding door when the door control switch is in the closed position.
      - 1) Flush mounted Adams-Rite F86 Series, concealed vertical rod exit devices mounted to the leading sliding panels.
2. **Guide Track/Threshold: Manufacturer's threshold as indicated.**
  1. Full Breakout Entrance Guide Track: Surface mounted aluminum guide track **with integral convex self-cleaning track** adjacent to the sidelite portion of the sliding automatic door assembly.

### **2.5 DOOR OPERATORS AND CONTROLS**

1. **Door Operator and Controller:**
  1. Electro-mechanical controlled unit utilizing a high-efficiency, energy efficient, DC motor requiring a maximum of 3 amp current draw, allowing 5 operators on one 20 amp circuit. The supplied system shall have the capability to operate at full performance well beyond a brown out and high line voltage conditions (85V – 265V) sensing changes and adjusting automatically. The operator shall allow an

## **SLIDING AUTOMATIC ENTRANCES**

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- adjustable hold open time delay of 0 to 60 seconds and have internal software to incorporate a self-diagnostic system.
2. Operating Temperature Range: -31° F to 130° F (-35° C to 54.44° C).
2. **Microprocessor Control Box:**
    1. Modular control unit to allow for changing technology. Factory-adjusted configuration with opening and closing speeds set to comply with ANSI/BHMA A156.10 requirements and electronic dampening to reduce wear on drive train. Should the drive train operations deviate from design criteria ranges, Watchdog Control Circuit Monitoring will assume command of the system and shut down the automatic function allowing a secondary supervisory circuit to perform as a backup. Control unit shall allow the following functions:
      - a. Diagnostics with the ability to produce application data.
    2. Mode Selector Control:
      - a. Multi-position keyed cylinder mode selector control shall allow selection of the indicated functions to be engaged when switch is turned to the appropriate setting.
      - b. Mode Selector Control Mounting: Control shall be mounted as indicated:
        - 1) Jamb mounted.
      - c. Mode selector control to allow the following functions:
        - 1) "Off"
        - 2) "Exit Only" one way traffic with automatic operation from the interior.
        - 3) "Two Way Traffic" allowing automatic operation from exterior and interior.
        - 4) "Partial Opening" energy saving door position allows door to automatically adjust opening width based on amount of usage, that is, full open during high use and partial open during low use. The control for this setting is programmable allowing adjustment to both the usage setting and the opening width.
        - 5) "Hold Open" doors activated and held in the full open position.

## **2.6 ACTIVATION AND SAFETY CONTROL DEVICES**

1. **General:** Provide the types of activation and safety devices specified in accordance with ANSI/BHMA standards, for the condition of exposure and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated. Coordinate activation and safety devices with door operation and door operator mechanisms.
2. **Combination Activation Motion Sensor/Safety Presence Sensor:**
  1. Shall be a sliding door sensor utilizing K-band microwave technology to detect motion and focused active infrared technology to detect presence, combined in a single housing surface mounted on each side of the header.
    - a. Presence sensor shall remain active at all times.

## **SLIDING AUTOMATIC ENTRANCES**

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- b. The sensor shall communicate with the automatic door operator through a self-monitoring connection that allows the door to go into a fail-safe mode preventing the door from closing in the event of a sensor failure.
2. Motion/presence detecting sensors to be field installed and adjusted.

### **2.7 ELECTRICAL**

1. **High-Efficiency DC Motor:** Maximum of 3 amp current draw, allowing 5 operators to run on one 20 Amp circuit.
2. **Power:** Self-detecting line voltage capable control. 120 VAC through 240 VAC, 50/60 Hz, 3 amp minimum incoming power with solid earth ground connection for each door system.
3. **Key Impulse Input:** Input for card readers or remote activation with independent adjustable hold open delay.
4. **Wiring:** Separate internal channel raceway free from moving parts.
5. **Brown out / high voltage capability:** System has capability to operate at full performance well beyond brown out and high voltage line conditions (85 V – 265 V) sensing changes and adjusting automatically.
6. **Convenience Battery:** Shall be concealed in header and capable of full operation with blackout conditions, including sensor capabilities for minimum of 100 cycles.

### **2.8 ALUMINUM FINISHES**

1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
2. **Anodized Finish:**
  1. AAMA 611, Clear, AA- M12C22A41, Class I, 0.018 mm.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

1. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, wall and floor construction, and other conditions affecting performance.
2. Examine roughing-in for electrical source power to verify actual locations of wiring connections.

## **SLIDING AUTOMATIC ENTRANCES**

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3. Proceed only after such discrepancies or conflicts have been resolved.

### **3.2 INSTALLATION**

1. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.
2. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
  1. Install surface mounted hardware using concealed fasteners to greatest extent possible.
  2. Set headers, carrier assemblies, tracks, operating brackets and guides level and true to location with anchorage for permanent support.
3. Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections.
4. Glazing: Glaze sliding automatic entrance door panels in accordance with the Glass Association of North America (GANA) Glazing Manual, published recommendations of glass product manufacturer, and published instructions of automatic entrance system manufacturer.
5. Sealants: Comply with requirements specified in division 7 Section "Joint Sealants" to provide a weather tight installation.
  1. Set thresholds, bottom guide and track systems and framing members in full bed of sealant.
  2. Seal perimeter of framing members with sealant.
6. Signage: Apply signage on both sides of each door and sidelite as required by ANSI/BHMA A156.10 and manufacturers installation instructions.

### **3.3 ADJUSTING**

1. Adjust door operators, controls and hardware for smooth and safe operation and for weather tight closure. Adjust doors in compliance with ANSI/BHMA A156.10.
2. Verify installation and alignment of all entrance weather-stripping as required for compliance with specified air infiltration requirements.

### **3.4 FIELD QUALITY CONTROL**

1. Before placing doors into operation, AAADM certified technician shall inspect and approve doors for compliance with ANSI/BHMA A156.10. Certified technician shall be approved by the manufacturer.

**SLIDING AUTOMATIC ENTRANCES**

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**3.5 CLEANING AND PROTECTION**

1. Clean adjacent surfaces soiled by door installation.
2. Clean glass and metal surfaces promptly after installation. Remove excess sealants, compounds, dirt and other substances. Repair damages to match original finish.

**3.6 DEMONSTRATION**

1. Engage a factory-authorized representative to train Owner's maintenance personnel to adjust, operate, and maintain safe operation of the door.

**END OF SECTION**

## **AUTOMATIC SWING DOOR OPERATOR**

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### **Part 1 General**

#### **1.1 GENERAL REQUIREMENTS**

1.1.1 Conform to requirements of Division 1.

#### **1.2 SUBMITTALS**

1.2.1 **Shop drawings:** Submit shop drawings in accordance with Section 01300. Indicate the following:

- .1 system arrangement and component sizes
- .2 method of assembly and anchorage,
- .3 locations of push buttons
- .4 finishes

1.2.2 **Recommended maintenance and operating data:** Submit 3 copies of the system manufacturers' procedures as part of the Project Record Manual.

### **Part 2 Products**

#### **1.3 AUTOMATIC DOOR OPERATORS**

1.3.1 **Automatic door operators - vestibule:** Surface mount, power open and spring close, maximum un-assisted opening force of 38 N., SW100 by Besam Canada Inc., GT 500HD by Gyro Tech Inc., Magic-Force by Stanley Canada Corp, 8100 Series by Record-USA and "Autoswing" HA-8 by Hunter Automatics Inc. Finish and colour to match door.

1.3.2 **Automatic door operators – washroom/interior doors:** Surface mount, power open and spring close, maximum un-assisted opening force of 22 N., SW100 by Besam Canada Inc., GT 710 Medium Duty by Gyro Tech Inc., 6100 Series by Record-USA and "Autoswing" HA-8 by Hunter Automatics Inc. Finish and colour to match door.

1.3.3 **Safety sensors:** by BEA, consisting of:

- .1 Two **superscan II**, door mounted presence sensors per automated door (one each door face). Each sensor unit to contain two modules (one Master module and one Slave module).
- .2 One LE-21 module complete with door position switch per approach side Superscan II (allows the door to operate as a manual door if push plate is not activated). (As required for Record model operators).

1.3.4 **Operator Hood:** Provide full header with integrated end caps for double doors. Finish and colour to match adjacent door frames.

1.3.5 **Push plate switch (interior vestibule):** Recessed (as standard within horizontal alum.

## **AUTOMATIC SWING DOOR OPERATOR**

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rail), all-active, brushed stainless steel finish, 6" diameter complete with barrier-free logo and text "Push to Open", PBR1 by BEA (or equal).

- 1.3.6 **Push plate switch (exterior use):** Recessed (as standard within horizontal alum. rail), all-active, brushed stainless steel finish, 6" diameter, to include weather boot protection, complete with barrier-free logo and text "Push to Open", PBR1 by BEA (or equal).
- 1.3.7 **Push plate switch (multiple use washrooms):** Recessed within partition, brushed stainless steel finish, 6" diameter complete with barrier-free logo and text; "Push to Open", PBR1 by BEA (or equal) exterior and interior.
- 1.3.8 **Push plate switch (single use washrooms):** Recessed within partition, brushed stainless steel finish, 6" diameter complete with barrier-free logo and text; "Push to Open", PBR1 by BEA (or equal) exterior and interior, and an additional interior 6" diameter push plate with text only "Push to Lock".

## **2 Execution**

### **2.1 INSTALLATION**

- 2.1.1 Provide the work of this Section in accordance with manufacturer's instructions, plumb, square, level at correct elevation, in alignment with adjacent work, anchored securely, and adjusted for proper function.
- 2.1.2 Coordinate the work of this Section with the electrical subtrade and provide necessary wiring, conduit and power supply feed. Conceal wiring and conduit from view. Refer to standard electrical detail E14A.

### **2.2 DOOR OPERATION - AUTOMATIC MODE**

#### **2.2.1 Automatic exterior swing door:**

- .1 **Normal hours and after hours:** Door opens by push buttons outside and inside, closes by time delay.
- .2 **Presence sensors:** Approach side superscan II activated by push buttons. Swing side superscan II is active at all times once door is activated. Sensors stop door movements from hitting objects in presence zones. Door movements continue after objects leave presence zone.
- .3 If push button is not activated, the door shall operate as a manual door only.
- .4 Provide recessed key switch jamb mounted at + 60" to disable the operator. Key switch to be connected to provide on/off unit function in lieu of manufacturer's standard toggle switch within cabinet..

#### **2.2.2 Automatic vestibule swing door: (into Branch)**



## **AUTOMATIC SWING DOOR OPERATOR**

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- .1 **Normal hours:** Door opens by push buttons outside and inside, closes by time delay.
- .2 **After hours:** Operator disabled, door inactive and locked by cylinder.
- .3 **Presence sensors:** Approach side **superscan II** activated by push buttons. Swing side **superscan II** is active at all times once door is activated. Sensors stop door movements from hitting objects in presence zones. Door movements continue after objects leave presence zone.
- .4 If push buttons are not activated the door shall operate as a manual door only.
- .5 Operator disabled by relay switch controlled by vault alarm system.
- .6 Provide recessed key switch jamb mounted at + 60" to disable the operator. Key switch to be connected to provide on/off function in lieu of manufacturer's standard toggle switch within cabinet..

### **2.2.3 Automatic vestibule swing door: (into ABM transaction area)**

- .1 **Normal and after hours:** Door opens by push buttons outside and inside, closes by time delay.
- .2 **Presence sensors:** Approach side **superscan II** activated by push buttons. Swing side **superscan II** is active at all times once door is activated. Sensors stop door movements from hitting objects in presence zones. Door movements continue after objects leave presence zone.
- .3 If push buttons are not activated, the door shall operate as a manual door only.
- .4 Provide recessed key switch jamb mounted at +60" to disable the operator (for servicing). Key switch to be connected to provide on/off function in lieu of manufacturer's standard toggle switch within cabinet.

### **2.2.4 Automatic washroom door: (multiple use)**

- .1 Door opens by push buttons outside and inside, closes by time delay.
- .2 If push buttons are not activated, the door shall operate as a manual door only.

### **2.2.5 Automatic washroom door: (single use)**

- .1 Door opens by push button outside and closes by time delay.
- .2 Pressing the "Push to Lock" button inside locks the door by energizing the electric strike and simultaneously disables the exterior push button.
- .3 Pressing the "Push to Open" button inside unlocks, opens and resets the system for the next user. Should the door be opened manually, the magnet switch resets the system.
- .4 If push buttons are not activated, the door shall operate as a manual door only.

**Note: \*\* Automatic washroom doors are indicated herein for special use considerations only upon specific requests of the TDCT Project Managers.\*\***

**END OF SECTION**

## **THERMAL FIXED WINDOW**

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### **PART 1 - GENERAL**

#### **1. RELATED DOCUMENTS**

- a. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **2. SUMMARY**

- a. Section includes Kawneer Architectural Aluminum Windows including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of window units.
  - 1) Types of aluminum windows include:
    - a) Kawneer Series AA®5450 Ultra Thermal (Standard Face)
    - b) Kawneer Series AA®5450 Ultra Thermal (Beveled Face)
    - c) Fixed window (AW-PG70-FW)
- b. Related Sections:
  - 1) 072700 "Air Barriers" for materials used to bridge between aluminum sliding glass door and building intersection
  - 2) 079200 "Joint Sealants" for joint sealants installed as part of the aluminum sliding door system
  - 3) 083213 "Sliding Aluminum-Framed Glass Doors"
  - 4) 084113 "Aluminum-Framed Entrances and Storefronts"
  - 5) 084313 "Aluminum-Framed Storefronts"
  - 6) 084329 "Sliding Storefronts"
  - 7) 084413 "Glazed Aluminum Curtain Walls"
  - 8) 084433 "Sloped Glazing Assemblies"
  - 9) 086300 "Metal-Framed Skylights"

#### **3. DEFINITIONS**

- a. Performance class designations according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS):
  - 1) AW: Architectural Window
- b. Performance grade number according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS):
  - 1) Design pressure number in pounds force per square foot used to determine the structural test pressure and water test pressure.
- c. Structural Test Pressure: For uniform load structural test, is equivalent to 150 percent of the design pressure.
- d. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).
- e. Minimum Test Size: Smallest gateway test size permitted for performance class. Products must be tested at minimum test size or at a size larger than minimum test size to comply with requirements for performance class.

## THERMAL FIXED WINDOW

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### 4. PERFORMANCE REQUIREMENTS

- a. General: Provide aluminum windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified, and that are of minimum test size indicated below:
  - 1) Size required by AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) for minimum gateway performance.
  - 2) Test size: 60" x 99"
- b. Structural Performance: Provide aluminum windows capable of withstanding the effects of the following loads, based on testing units representative of those indicated for the Project that pass AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Uniform Load Structural Test:
  - 1) Design Wind Loads: Determine design wind loads applicable to the Project from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2- Analytical Procedure," based on mean roof heights above grade indicated on Drawings. All wind loads are to comply with the OBC and are to be identified in the stamped engineered shop drawings.
    - a) Basic Wind Speed (MPH): (\_\_\_\_\_)
    - b) Importance Factor (I, II, III): (\_\_\_\_\_)
    - c) Exposure Category (A,B,C,D): (\_\_\_\_\_)
  - 2) Deflection: Design glass framing system to limit lateral deflections of glass edges to less than 1/175 of glass-edge length or 3/4 inch (19 mm), whichever is less, at design pressure based on testing performed according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Uniform Load Deflection Test or structural computations.
- c. Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change (\_\_\_\_\_) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.  
AA@5450 (Standard Face)
- d. Condensation Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, with a CRF not less than: 78 (frame) and 79 (glass).
- e. Temperature Index (I): Provide aluminum windows tested for thermal performance according to CSA-A440 with a Temperature Index not less than:  
68 (frame) and 75 (glass).
- f. Energy Efficiency:
  - 1) Thermal Transmittance Test (U-Factor): When tested to AAMA specification 1503, AAMA specification 507 or NFRC 100 the thermal transmittance (U-Factor) shall not be more than:
    - a) 1" (25.4mm) insulating glass with exterior 3/16" (4.76 mm) annealed clear glass, aluminum spacer, and interior 3/16" (4.76 mm) annealed clear glass.

## THERMAL FIXED WINDOW

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- (1) Provide aluminum windows simulated for thermal performance according to AAMA 507 and NFRC 100 with a thermal transmittance (U-Factor) of 0.22 to 0.52 BTU/hr/sf/°F. (Based on center of glass U-Factor range 0.10 to 0.48).
  - b) 1-1/2" (38.1 mm) insulating glass with exterior 1/8" (3.17 mm) annealed low E glass, aluminum spacer, argon gas, center 1/8" (3.17 mm) low E tempered glass, aluminum spacer, argon gas, and interior 1/8" (3.17 mm) annealed clear glass.
    - (1) Provide aluminum windows simulated for thermal performance according to AAMA 507 and NFRC 100 with a thermal transmittance (U-Factor) of 0.19 to 0.37 BTU/hr/sf/°F. (Based on center of glass U-Factor range 0.10 to 0.32).
- g. Solar Heat-Gain Coefficient (SHGC): Provide aluminum windows with a whole-window SHGC as determined according to NFRC 200 and AAMA 507 procedures.
- h. Air Infiltration: Maximum rate not more than indicated when tested according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Air Infiltration Test.
  - 1) Maximum Rate: 0.1 cfm/sq. ft. (0.5 L/s•m<sup>2</sup>) of area at an inward test pressure of 6.24 lbf/sq. ft. (300 Pa) in accordance with ASTM E283.
- i. Water Resistance: No water leakage as defined in AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) referenced test methods at a water test pressure equaling that indicated, when tested according to ASTM E547 and ASTM E331.
  - 1) Test Pressure: 20 percent of positive design pressure, but not more than 10 lbf/sq. ft. (478 Pa).
- j. Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC): When tested to AAMA Specification 1801 and in accordance with ASTM E1425 and ASTM E90, the STC and OITC Rating shall not be less than:
  - 1) 1-1/2" triple insulating glass made with exterior 1/8" soft coat low E glass, thermoplastic butyl spacer, argon gas, center 1/8" soft coat low E glass thermoplastic butyl spacer, argon gas, and interior 1/8" clear glass: 29 (STC) and 23 (OITC)

## THERMAL FIXED WINDOW

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AA@5450 (Beveled Face)

- k. Energy Efficiency:
  - 1) Thermal Transmittance Test (U-Factor): When tested to AAMA specification 1503, AAMA specification 507 or NFRC 100 the thermal transmittance (U-Factor) shall not be more than:
    - a) 1" (25.4mm) insulating glass with exterior 1/8" (4.76 mm) annealed clear glass, aluminum spacer, and interior 1/8" (4.76 mm) annealed clear glass.
      - (1) Provide aluminum windows simulated for thermal performance according to AAMA 507 and NFRC 100 with a thermal transmittance (U-Factor) of 0.22 to 0.52 BTU/hr/sf/°F. (Based on center of glass U-Factor range 0.10 to 0.48).
    - b) 1-1/4" (31.7 mm) insulating glass with exterior 1/8" (3.17 mm) annealed low E glass, aluminum spacer, argon gas, center 1/8" (3.17 mm) low E tempered glass, aluminum spacer, argon gas, and interior 1/8" (3.17 mm) annealed clear glass.
      - (1) Provide aluminum windows simulated for thermal performance according to AAMA 507 and NFRC 100 with a thermal transmittance (U-Factor) of 0.20 to 0.39 BTU/hr/sf/°F. (Based on center of glass U-Factor range 0.10 to 0.34).

AA@5450 (Standard Face) and AA@5450 (Beveled Face)

- l. Forced-Entry Resistance: Comply with Performance Grade 10 requirements when tested according to ASTM F 588.
- m. Environmental Product Declarations (EPD): Shall have a Type III Product-Specific EPD created from a Product Category Rule.

## 5. SUBMITTALS

- a. Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of aluminum window indicated.
  - 1) Recycled Content:
    - a) Provide documentation that aluminum has a minimum of 50% mixed pre- and post-consumer recycled content with a sample document illustrating project specific information that will be provided after product shipment.
    - b) Once product has shipped, provide project specific recycled content information, including:
      - 1) Indicate recycled content; indicate percentage of pre- and post-consumer recycled content per unit of product.
      - 2) Indicate relative dollar value of recycled content product to total dollar value of product included in project.
      - 3) Indicate location recovery of recycled content.
      - 4) Indicate location of manufacturing facility.
  - 2) Environmental Product Declaration (EPD).
    - a. Include a Type III Product-Specific EPD created from a Product Category Rule.

## **THERMAL FIXED WINDOW**

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- b. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances and installation details.
- c. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- d. Samples for Verification: For aluminum windows and components required.
- e. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.
- f. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type, class, grade, and size of aluminum window. Test results based on use of downsized test units will not be accepted.

## **6. QUALITY ASSURANCE**

- a. Installer Qualifications: An installer which has had successful experiences with installation of the same or similar units required for this project and other projects of similar size and scope.
- b. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- c. Source Limitations: Obtain aluminum windows through one source from a single manufacturer.
- d. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum windows and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.
  - 1) Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- e. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1) Build mockup for type(s) of window(s) indicated, in location(s) shown on Drawings.
- f. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

## **7. PROJECT CONDITIONS**

- a. Field Measurements: Verify aluminum window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

## **8. WARRANTY**

- a. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.

## **THERMAL FIXED WINDOW**

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- 1) Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

## **PART 2 - PRODUCTS**

### **1. MANUFACTURERS**

a. Basis-of-Design Product:

- 1) Kawneer Company Inc.
- 2) Series AA®5450 Ultra Thermal Fixed (Standard Face)
- 3) Series AA®5450 Ultra Thermal Fixed (Beveled Face)
- 4) 4 5/8" (117.48 mm) frame depth
- 5) AW-PG70-FW

EDITOR NOTE: PROVIDE INFORMATION BELOW INDICATING APPROVED ALTERNATIVES TO THE BASIS-OF-DESIGN PRODUCT.

b. Subject to compliance with requirements, provide a comparable product by the following:

- 1) Manufacturer: (\_\_\_\_\_)
- 2) Series: (\_\_\_\_\_)
- 3) Profile dimension: (\_\_\_\_\_)
- 4) Performance Grade: (\_\_\_\_\_)

c. Substitutions: Refer to Substitutions Section for procedures and submission requirements.

- 1) Pre-Contract (Bidding Period) Substitutions: Submit written requests ten (10) days prior to bid date.
- 2) Post-Contract (Construction Period) Substitutions: Submit written request in order to avoid window installation and construction delays.
- 3) Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
- 4) Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for window system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum windows for a period of not less than ten (10) years. (Company Name)
- 5) Test Reports: Submit test reports verifying compliance with each test requirement required by the project.
- 6) Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

d. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

## **THERMAL FIXED WINDOW**

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### **2. MATERIALS**

- a. Aluminum Extrusions: Alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and sash members.
  - 1) Recycled Content: Shall have a minimum of 50% mixed pre- and post-consumer recycled content.
    - a) Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
    - b) Indicate relative dollar value of recycled content product to total dollar value of product included in project.
    - c) Indicate location recovery of recycled content.
    - d) Indicate location of manufacturing facility.
- b. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.
- c. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- d. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- e. Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

### **3. WINDOW**

- a. Window Type: Fixed Window
- b. Performance Requirements: Provide aluminum windows of performance indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS)
  - 1) Performance Class and Grade: AW-PG70-FW

### **4. GLAZING**

- a. Glass and Glazing Materials: Refer to Division 08 Section "Glazing" for glass units and glazing requirements applicable to glazed aluminum window units.
- b. Glazing System: Glazing method shall be a wet/dry type in accordance with manufacturer's standards. Exterior glazing shall be silicone back bedding sealant. Interior glazing shall be snap-in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864.



## **THERMAL FIXED WINDOW**

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### **5. HARDWARE**

- a. General: As per drawings/documents.

### **6. INSECT SCREENS**

- a. General: As per drawings/documents.

### **7. FABRICATION**

- a. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
  - 1) Profiles that are sharp, straight, and free of defects or deformations.
  - 2) Accurately fit joints; make joints flush, hairline and weatherproof.
  - 3) Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
  - 4) Physical and thermal isolation of glazing from framing members.
  - 5) Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  - 6) Provisions for field replacement of glazing.
  - 7) Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- b. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- c. Fabricate aluminum windows that are re-glazable without dismantling sash or framing.
- d. Thermally Improved Construction: Fabricate aluminum windows with an integral, concealed, low-conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact. Thermal barriers shall be designed in accordance with AAMA TIR A8.
  - 1) Frame thermal barrier shall be polyamide with a minimum of 1" (25.4 mm) separation, installed continuously and mechanically bonded to the aluminum.
- e. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.
- f. Sub frames: Provide sub frames with anchors for window units as shown, of profile and dimensions indicated but not less than 0.093-inch (2.4-mm) thick extruded aluminum. Miter or cope corners, and join with concealed mechanical joint fasteners. Finish to match window units. Provide sub frames capable of withstanding design loads of window units.
- g. Factory-Glazed Fabrication: Glaze aluminum windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 08 Section "Glazing" and with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).

## **THERMAL FIXED WINDOW**

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- h. Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section "Glazing" and glazing system indicated. Provide glazing stops to match frame.

## **8. ALUMINUM FINISHES**

- a. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- b. Factory Finishing:
  - 1) Refer to drawings/documents.

## **PART 3 - EXECUTION**

### **1. EXAMINATION**

- a. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.
  - 1) Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
  - 2) Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
  - 3) Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
  - 4) Proceed with installation only after unsatisfactory conditions have been corrected.

### **2. INSTALLATION**

- a. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.
- b. Install aluminum framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- c. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- d. Install aluminum framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within sliding door to the exterior.
- e. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

## **THERMAL FIXED WINDOW**

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### **3. FIELD QUALITY CONTROL**

- a. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
  - 1) Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- b. Testing Services: Testing and inspecting of installed windows shall take place as follows:
  - 1) Testing Methodology: Testing Standard shall be per AAMA 502 including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 for Water Penetration Test.
    - a) Air Infiltration Test: Conduct test in accordance with ASTM E 783 at a minimum uniform static test pressure of 1.57 psf (75 Pa) for CW or 6.24 psf (300 Pa) for AW. The maximum allowable rates of air leakage for field testing shall not exceed 1.5 times the project specifications.
    - b) Water Infiltration Test: Water penetration resistance tests shall be conducted in accordance with ASTM E 1105 at a static test pressure equal to 2/3 the specified water test pressure.
  - 2) Testing Extent: Architect shall select window units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present.
  - 3) Test Reports: Shall be prepared according to AAMA 502.

### **4. ADJUSTING, CLEANING, AND PROTECTION**

- a. Adjust operating sashes, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.
- b. Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- c. Clean glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- d. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- e. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

**THERMAL FIXED WINDOW**

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**5. DEMONSTRATION**

- a. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain window operating system. Refer to Division 01 Section "Demonstration and Training."

**END OF SECTION**

## **THERMAL HORIZONTAL SLIDING**

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### **PART 1 - GENERAL**

#### **1. RELATED DOCUMENTS**

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **2. SUMMARY**

Section Includes: Kawneer Architectural Aluminum Windows including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of window units.

- 1) Types of aluminum windows include:
  - a) Kawneer Series AA@5450 Ultra Thermal
  - b) Horizontal Sliding (XO/OX: AW-PG40-HS; XX: AW-PG50-HS; XOX: AW-PG40-HS)

Related Sections:

- 2) 072700 "Air Barriers" for materials used to bridge between aluminum sliding glass door and building intersection
- 3) 079200 "Joint Sealants" for joint sealants installed as part of the aluminum sliding door system
- 4) 083213 "Sliding Aluminum-Framed Glass Doors"
- 5) 084113 "Aluminum-Framed Entrances and Windows"
- 6) 084313 "Aluminum-Framed Storefronts"
- 7) 084329 "Sliding Storefronts"
- 8) 084413 "Glazed Aluminum Curtain Walls"
- 9) 084433 "Sloped Glazing Assemblies"
- 10) 086300 "Metal-Framed Skylights"

#### **3. DEFINITIONS**

Performance class designations according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS):

- 1) AW: Architectural Window

Performance grade number according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS):

- 2) Design pressure number in pounds force per square foot used to determine the structural test pressure and water test pressure.

Structural Test Pressure: For uniform load structural test, is equivalent to 150 percent of the design pressure.

Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

Minimum Test Size: Smallest gateway test size permitted for performance class.

Products must be tested at minimum test size or at a size larger than minimum test size to comply with requirements for performance class.

## THERMAL HORIZONTAL SLIDING

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### 4. PERFORMANCE REQUIREMENTS

General: Provide aluminum windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified, and that are of minimum test size indicated below:

- 1) Size required by AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) for minimum gateway performance.
- 2) Test size: {XO/OX and XX; 99" x 79"}, {XOX; 148-1/2" x 79"}.

Structural Performance: Provide aluminum windows capable of withstanding the effects of the following loads, based on testing units representative of those indicated for the Project that pass AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Uniform Load Structural Test:

- 3) from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings. All wind loads are to comply with the OBC and are to be identified in the stamped engineered shop drawings.
  - a) Basic Wind Speed (MPH): {\_\_\_\_\_}
  - b) Importance Factor (I, II, III): {\_\_\_\_\_}
  - c) Exposure Category (A,B,C,D): {\_\_\_\_\_}
- 4) Deflection: Design glass framing system to limit lateral deflections of glass edges to less than 1/175 of glass-edge length or 3/4 inch (19 mm), whichever is less, at design pressure based on testing performed according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Uniform Load Deflection Test or structural computations.

Thermal Movements: Provide aluminum windows, including anchorage, that allow for thermal movements resulting from the following maximum change {\_\_\_\_} in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

Environmental Product Declarations (EPD): Shall have a Type III Product-Specific EPD created from a Product Category Rule.

### 5. SUBMITTALS

Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of aluminum window indicated.

- 1) Recycled Content:
  - a) Provide documentation that aluminum has a minimum of 50% mixed pre- and post-consumer recycled content with a sample document illustrating project specific information that will be provided after product shipment.
  - b) Once product has shipped, provide project specific recycled content information, including:

## **THERMAL HORIZONTAL SLIDING**

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- 1) Indicate recycled content; indicate percentage of pre- and post-consumer recycled content per unit of product.
  - 2) Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3) Indicate location recovery of recycled content.
  - 4) Indicate location of manufacturing facility.
- 2) Environmental Product Declaration (EPD).
- a. Include a Type III Product-Specific EPD created from a Product Category Rule.

Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances and installation details.

Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.

Samples for Verification: For aluminum windows and components required.

Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type, class, grade, and size of aluminum window. Test results based on use of downsized test units will not be accepted.

Maintenance Data: For operable sash, operating hardware and finishes to be include in maintenance manuals.

## **6. QUALITY ASSURANCE**

Installer Qualifications: An installer which has had successful experiences with installation of the same or similar units required for this project and other projects of similar size and scope.

Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.

Source Limitations: Obtain aluminum windows through one source from a single manufacturer.

Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum windows and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.

- 1) Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

- 2) Build mockup for type(s) of window(s) indicated, in location(s) shown on Drawings.

## **THERMAL HORIZONTAL SLIDING**

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Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

### **7. PROJECT CONDITIONS**

Field Measurements: Verify aluminum window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

### **8. WARRANTY**

Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.

- 1) Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

## **PART 2 - PRODUCTS**

### **1. MANUFACTURERS**

Basis-of-Design Product:

- 1) Kawneer Company Inc.
- 2) Refer to drawings/documents for product specifications.
- 3) Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for window system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum windows for a period of not less than ten (10) years. (Company Name)
- 4) Test Reports: Submit test reports verifying compliance with each test requirement required by the project.
- 5) Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

### **2. MATERIALS**

Aluminum Extrusions: Alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and sash members.

- 1) Recycled Content: Shall have a minimum of 50% mixed pre- and post-consumer recycled content.
  - a) Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - b) Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - c) Indicate location recovery of recycled content.
  - d) Indicate location of manufacturing facility.



### **THERMAL HORIZONTAL SLIDING**

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Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.

Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

Sliding-Type Weather Stripping: Provide woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric. Comply with AAMA 701/702.

2) Weather Seals: Provide weather stripping with integral barrier fin or fins of semi-rigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.

Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

### **3. WINDOW**

Window Type: Horizontal Sliding Window

Performance Requirements: Provide aluminum windows of performance indicated that comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS)

1) Performance Class and Grade: [XO/OX: AW-PG40-HS; XX: AW-PG50-HS; XOX: AW-PG40-HS]

Condensation-Resistance Factor (CRF): Provide aluminum windows tested for thermal performance according to AAMA 1503, with a CRF not less than Single Slide: 76 (frame) and 77 (glass) or Double Slide: 69 (frame) and 77 (glass).

Temperature Index (I): Provide aluminum windows tested for thermal performance according to CSA-A440 with a Temperature Index not less than Single Slide: 57 (frame) and 73 (glass) or Double Slide: 36 (frame) and 74 (glass).

Energy Efficiency:

2) Thermal Transmittance: Provide aluminum windows tested for thermal performance according to AAMA 1503.

a) Provide aluminum windows tested for thermal performance according to AAMA 1503, with a thermal transmittance (U-factor) no more than Single Slide: 0.25 BTU/hr/sf/° F or Double Slide: 0.28 BTU/hr/sf/° F.

## **THERMAL HORIZONTAL SLIDING**

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- b) Provide aluminum windows simulated for thermal performance according to AAMA 507 and NFRC 100 with a thermal transmittance (U-factor) range of;  
Single Slide: 0.23 to 0.38 BTU/hr/sf/° F or Double Slide: 0.25 to 0.39 BTU/hr/sf/° F  
(Based on center of glass U-factor range 0.10 to 0.32 for triple glazing).
- 3) Solar Heat-Gain Coefficient (SHGC): Provide aluminum windows with a whole-window SHGC as determined according to NFRC 200 and AAMA 507 procedures.

Air Infiltration: Maximum rate not more than indicated when tested according to AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS), Air Infiltration Test.

- 4) Maximum Rate: 0.3 cfm/sq. ft. (0.5 L/s•m<sup>2</sup>) of area at an inward test pressure of 6.24 lbf/sq. ft. (300 Pa) in accordance with ASTM E283.

Water Resistance: No water leakage as defined in AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) referenced test methods at a water test pressure equaling that indicated, when tested according to ASTM E547 and ASTM E331.

- 5) Test Pressure: XO/OX and XX; 20 percent of positive design pressure, but not more than 10 lbf/sq. ft. (478 Pa).
- 6) Test Pressure: XOX; 20 percent of positive design pressure, but not more than 12 lbf/sq. ft. (575 Pa).

Forced-Entry Resistance: Comply with Performance Grade 10 requirements when tested according to ASTM F 588.

Life-Cycle Testing: Test according to AAMA 910 and comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).

Operating Force and Auxiliary (Durability) Tests: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS) for operating window types indicated.

Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC): When tested to AAMA Specification 1801 and in accordance with ASTM E1425 and ASTM E90, the STC and OITC Rating shall not be less than:

- 7) 1-1/2" triple insulating glass made with exterior 1/8" soft coat low E glass, thermoplastic butyl spacer, argon gas, center 1/8" soft coat low E glass thermoplastic butyl spacer, argon gas, and interior 1/8" clear glass:  
XO UNIT = 32 (STC) and 26 (OITC)  
XX UNIT = 33 (STC) and 26 (OITC)

Environmental Product Declarations (EPD): Shall have a Type III Product-Specific EPD created from a Product Category Rule specific to North America.

## **4. GLAZING**

Glass and Glazing Materials: Refer to Division 08 Section "Glazing" for glass units and glazing requirements applicable to glazed aluminum window units.

Glazing System: Glazing method shall be a wet/dry type in accordance with manufacturer's standards. Exterior glazing shall be silicone back bedding sealant.

Interior glazing shall be snap-in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864.

## **THERMAL HORIZONTAL SLIDING**

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### **5. HARDWARE**

General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash weight and dimensions.

Horizontal Sliding Windows: Provide the following operating hardware:

- 1) Handle: Continuous, integral pulls.
- 2) Sash Locks.
- 3) Composite adjustable tandem roller.
- 4) Stainless Steel roller track.
- 5) Standard auto lock.
- 6) Limit device.
- 7) Optional Sash Lock: Spring-loaded, snap-type lock on bottom rail of lower sash.
- 8) Limit Device: Sash stop limit device; for bottom sash located at jamb; two per sash.

### **6. INSECT SCREENS**

General: Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. Fabricate insect screens to fully integrate with window frame. Locate screens on outside of window and provide for each operable exterior sash.

- 1) Comply with SMA 1004, "Specifications for Aluminum Tubular Frame Screens for Windows," for minimum standards of appearance, fabrication, attachment of screen fabric, hardware, and accessories unless more stringent requirements are indicated.

Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1004. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners and removable PVC spline.

- 2) Extruded-Aluminum or Aluminum Tubular Framing Sections and Cross Braces: Not less than 0.050-inch (1.3-mm) wall thickness.
- 3) Finish: Manufacturer's standard.

Aluminum Wire Fabric: 18-by-16 mesh/inch (18-by-16 mesh/25.4mm) of 0.011-inch- (0.28-mm-) diameter, coated aluminum wire.

- 4) Wire-Fabric Finish: Charcoal Grey or Natural Brite-Kote.

Glass-Fiber Mesh Fabric: 18-by-16 mesh/inch (18-by-16 mesh/25.4mm) of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration; in the following color. Comply with ASTM D 3656.

- 5) Mesh Color: Charcoal or Silver Grey.

## THERMAL HORIZONTAL SLIDING

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### 7. FABRICATION

Framing Members, General: Fabricate components that, when assembled, have the following characteristics:

- 1) Profiles that are sharp, straight, and free of defects or deformations.
- 2) Accurately fit joints; make joints flush, hairline and weatherproof.
- 3) Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
- 4) Physical and thermal isolation of glazing from framing members.
- 5) Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
- 6) Provisions for field replacement of glazing.
- 7) Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

Fabricate aluminum windows that are re-glazable without dismantling sash or framing.

Thermally Improved Construction: Fabricate aluminum windows with an integral, concealed, low-conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact. Thermal barriers shall be designed in accordance with AAMA TIR A8.

- 8) Frame thermal barrier shall be polyamide with a minimum of 1" (25.4 mm) separation, installed continuously and mechanically bonded to the aluminum.
- 9) Sash thermal barrier shall be polyamide with a minimum of 1/2" (12.7 mm) separation, installed continuously and mechanically bonded to the aluminum.

Weather Stripping: Provide full-perimeter weather stripping for each operable sash.

Weep Holes: Provide weep holes and internal passages in window frames to conduct infiltrating water to exterior.

Provide water-shed members as required above lines of natural water penetration.

Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.

Sub frames: Provide sub frames with anchors for window units as shown, of profile and dimensions indicated but not less than 0.093-inch (2.4-mm) thick extruded aluminum.

Miter or cope corners, and join with concealed mechanical joint fasteners. Finish to match window units. Provide sub frames capable of withstanding design loads of window units.

## **THERMAL HORIZONTAL SLIDING**

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Factory-Glazed Fabrication: Glaze aluminum windows in the factory where practical and possible for applications indicated. Comply with requirements in Division 08 Section "Glazing" and with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).

Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section "Glazing" and glazing system indicated. Provide glazing stops to match sash.

## **8. ALUMINUM FINISHES**

Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

- 1) Finish to be as per drawings/documents.

## **PART 3 - EXECUTION**

### **1. EXAMINATION**

Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.

- 1) Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
- 2) Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
- 3) Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
- 4) Proceed with installation only after unsatisfactory conditions have been corrected.

### **2. INSTALLATION**

Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.

Install aluminum framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.

Install aluminum framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within sliding door to the exterior.

Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

## **THERMAL HORIZONTAL SLIDING**

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### **3. FIELD QUALITY CONTROL**

Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.

- 1) Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.

Testing Services: Testing and inspecting of installed windows shall take place as follows:

- 2) Testing Methodology: Testing Standard shall be per AAMA 502 including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 for Water Penetration Test.
  - a) Air Infiltration Test: Conduct test in accordance with ASTM E 783 at a minimum uniform static test pressure of 1.57 psf (75 Pa) for CW or 6.24 psf (300 Pa) for AW. The maximum allowable rates of air leakage for field testing shall not exceed 1.5 times the project specifications.
  - b) Water Infiltration Test: Water penetration resistance tests shall be conducted in accordance with ASTM E 1105 at a static test pressure equal to 2/3 the specified water test pressure.
- 3) Testing Extent: Architect shall select window units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present.
- 4) Test Reports: Shall be prepared according to AAMA 502.

### **4. ADJUSTING, CLEANING, AND PROTECTION**

Adjust operating sashes, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.

Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

Clean glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

**THERMAL HORIZONTAL SLIDING**

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**5. DEMONSTRATION**

Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain window operating system. Refer to Division 01 Section "Demonstration and Training."

**END OF SECTION**

## **FINISH HARDWARE**

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### **1. General**

#### **1.1 GENERAL REQUIREMENTS**

1.1.1 Conform to requirements of Division 1.

#### **1.2 WORK INCLUDED**

1.2.1 Provide and co-ordinate templates and instructions required for preparation of doors and frames to the appropriate Sections.

1.2.2 **Provide assistance:**

- .1 to the Owner, when requested, in establishing a keying schedule
- .2 and supervision when requested, to ensure correct installation.

#### **1.3 SUBMITTALS**

1.3.1 Recommended maintenance, operating data, and inspection procedures: Submit 3 copies of the system manufacturers' procedures as part of the Project Record Manual.

### **2. Products**

#### **2.1 HARDWARE**

2.1.1 Provide finish hardware in accordance with the **Door, Frame & Hardware Schedules** noted and incorporated into the Project Manual and/or as indicated on project drawings.

- .1 Refer to specification Section 08 71 00 for additional hardware information related to sliding and swing doors within glazed wood office partitions.

2.1.2 Supply hardware with fasteners and other items and parts required for complete installation and functioning.

2.1.3 Notwithstanding the requirements of the Door, Frame and Hardware Schedule, provide 3 hinges on doors less than 7'-6" in height and one additional hinge for each additional 2'-6" or fraction thereof.

#### **2.2 KEYS**

2.2.1 Provide two change keys per lock.

2.2.2 Provide construction keying, two change keys per lock, and six master keys.



## **FINISH HARDWARE**

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### **3. Execution**

#### **3.1 INSTALLATION**

3.1.1 Provide hardware in accordance with the manufacturer's instructions and recommendations.

3.1.2 Cut doors neatly, and at mounting heights as recommended for metal doors.

3.1.3 Provide hardware and trim square and plumb to doors. Locate doorstops to contact doors at the widest opening, unless otherwise instructed.

#### **3.2 ADJUSTMENT**

3.2.1 Adjust hardware so that latches and locks operate smoothly and without binding, and closers act positively with the least possible resistance in use. Lubricate hardware if required by supplier's instructions.

3.2.2 Clean hardware after installation in accordance with supplier's instructions.

#### **3.3 KEYS**

3.3.1 Safeguard keys out of unauthorized hands. Hand deliver keys to Owner at Substantial Performance.

**END OF SECTION**

## **DOOR HARDWARE**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Mechanical door hardware for swinging doors, sliding doors and folding doors.
- .2 Cylinders for door hardware specified in other Sections.
- .3 Electrified door hardware.

#### **1.3 RELATED SECTIONS**

- .1 Division 08 Section Hollow Metal Doors and Frames: Door silencers provided as part of hollow-metal frames.
- .2 Division 08 Section Wood Doors.
- .3 Division 08 Section Access Doors and Frames: Access door hardware.
- .4 Division 08 Section Folding Grilles: Folding grille hardware.
- .5 Division 08 Section Aluminum-Framed Entrances and Storefronts: Aluminum-framed door hardware, and automatic power-operated sliding and swinging entrance doors equipment.
- .6 Division 26 Electrical: Connections to electrical power system and for low-voltage wiring work.
- .7 Division 28 Electronic Safety and Security:
  - .1 Access control devices installed at door openings and provided as part of a security system.
  - .2 Intrusion detection devices installed at door openings and provided as part of an intrusion-detection system.
  - .3 Fire-alarm system; for connections to building fire-alarm system.

#### **1.4 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination: Coordinate with other work having a direct bearing on work of this section.

## **DOOR HARDWARE**

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- .1 Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
- .2 Coordinate Owner's keying requirements and access control during the course of the Work.
- .3 Sequencing: Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

### **1.5 SUBMITTALS FOR REVIEW**

- .1 Shop Drawings:
  - .1 Indicate locations and mounting heights of each type of hardware, schedules, catalogue cuts, electrical characteristics and connection requirements.
- .2 Samples:
  - .1 Submit one sample of latchset, lockset and closer illustrating style, colour, and finish.
  - .2 Samples will be returned to supplier on or before date of Substantial Completion.
- .3 Hardware List:
  - .1 Submit contract hardware list indicating specified hardware, including make, model, material, function, size, finish and other pertinent information.
  - .2 Prepare hardware list by Architectural Hardware Consultant (AHC) who is also an Electrified Hardware Consultant (EHC).
- .4 Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

### **1.6 SUBMITTALS FOR INFORMATION**

- .1 Installation Data: Manufacturer's special installation requirements, rough-in dimensions and fire resistance ratings.
- .2 Field reports.

### **1.7 CLOSEOUT SUBMITTALS**

- .1 Operation and Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

## **DOOR HARDWARE**

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### **.2 Record Documentation:**

- .1 Final hardware and keying schedule including locations of installed cylinders and master key codes.**
- .2 Keys: Deliver with identifying tags to Owner. Obtain receipt for keys.**

## **1.8 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Extra Stock Materials: Provide ten extra key lock cylinders for each master keyed group.**
- .2 Tools:**
  - .1 Provide special wrenches and tools applicable to each different or special hardware component.**
  - .2 Provide maintenance tools and accessories supplied by hardware component manufacturer.**

## **1.9 QUALITY ASSURANCE**

- .1 Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) who is also an Electrified Hardware Consultant (EHC), to assist in the work of this section.**

## **1.10 REGULATORY REQUIREMENTS**

- .1 Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies conforming to NFPA 80 that are listed and labelled by a qualified testing agency, for fire- protection ratings indicated, based on testing at positive pressure according to CAN4-S104 or NFPA 252.**
- .2 Products Requiring Electrical Connection: Listed and classified by UL, ULC or testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.**
- .3 Provide certificate of compliance from authority having jurisdiction indicating approval of fire rated doors.**

## **1.11 DELIVERY, STORAGE, AND PROTECTION**

- .1 Package hardware items individually; label and identify each package with door opening code to match hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.**

## **1.12 WARRANTY**

## **DOOR HARDWARE**

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- .1 Manufacturer's Warranties: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period, from date of Substantial Performance.
  - .1 Failures include:
    - .1 Structural failures including excessive deflection, cracking, or breakage.
    - .2 Faulty operation of doors and door operators and hardware.
    - .3 Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
  - .2 Warranty Period:
    - .1 Locksets: Seven years.
    - .2 Electromagnetic and Delayed-Egress Locks: Five years.
    - .3 Exit Devices: Five years.
    - .4 Manual Closers: 10 years.

### **Part 2 Products**

#### **2.1 MATERIALS – GENERAL**

- .1 Source Limitations: Obtain each type of door hardware from a single manufacturer.
  - .1 Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise specified. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

#### **2.2 MANUFACTURERS**

- .1 Subject to conformance with requirements provide products as scheduled.

#### **2.3 DOOR HARDWARE**

- .1 Provide door hardware for each door as scheduled to comply with requirements in this Section.
  - .1 Door Hardware Sets: Provide quantity, item, size, finish or colour as scheduled.
  - .2 Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
  - .3 Examine requirements of Related Sections. Furnish and install or furnish only items, as applicable. Where items are furnished by this Section, require the Installer of work in the Related Section to install the furnished items.

#### **2.4 KEYING**

## **DOOR HARDWARE**

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- .1 Keying System: Factory registered, conforming to guidelines in BHMA A156.28, Appendix A.
- .2 Verify building's keying system with Consultant before purchasing locks.
- .3 Door Lock Keying:
  - .1 Locksets and Cylinders: Master-Keyed or Grand Master Keyed to Owner's requirements.
  - .2 Supply six Master keys and two keys for each lock.
- .4 Provide temporary core during construction, to be replaced by final cores at final completion.
  - .1 When directed by Consultant, remove temporary cores and handover with construction keys and extractor keys to Consultant.

### **2.5 KEY CABINET**

- .1 Key Control Cabinet: BHMA A156.5; metal cabinet with door and lock keyed to building system, with baked-enamel finish; containing key-holding hooks, labels, 2 sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of 120 percent of the number of locks.
- .2 When directed by Consultant, handover key cabinet to Consultant.

### **2.6 FINISHES**

- .1 As specified in separate Door Hardware Schedule.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.
- .2 Verify that electric power is available to power operated devices and is of the correct characteristics.
- .3 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- .1 Install hardware in accordance with manufacturer's instructions.
- .2 Use templates provided by hardware item manufacturer.

## **DOOR HARDWARE**

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- .3 Locate automatic door operator switches where indicated.

## **DOOR HARDWARE**

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### **3.3 FIELD QUALITY CONTROL**

- .1 Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.
- .2 Prepare inspection reports.

### **3.4 CLEANING AND ADJUSTING**

- .1 Adjust hardware for smooth operation. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
- .2 Clean adjacent surfaces soiled by door hardware installation.
- .3 Clean operating items as necessary to restore proper function and finish.

### **3.5 PROTECTION OF FINISHED WORK**

- .1 Do not permit adjacent work to damage hardware or finish.
- .2 Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

**END OF SECTION**



## **GLASS AND GLAZING**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Glass and glazing for sections referencing this section for Products and installation.

#### **1.3 RELATED SECTIONS**

- .1 Division 07 Section Joint Sealants: Sealant and back-up material.
- .2 Division 08 Section Aluminum-Framed Entrances and Storefronts.
- .3 Division 08 Section Aluminum Windows.

#### **1.4 PERFORMANCE REQUIREMENTS**

- .1 Provide glass and glazing materials for continuity of building enclosure vapour retarder and air barrier:
  - .1 To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapour retarder seal.
  - .2 To maintain a continuous air barrier and vapour retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- .2 Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as calculated in accordance with applicable code, and to withstand design pressures specified in applicable sections.
- .3 Where glass extends from 1070 mm to floor, design lateral loads, in addition to other load requirements, in accordance with applicable codes.
- .4 Unless otherwise specified, limit glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.
- .5 Provide tempered, laminated, laminated-tempered glass in doors, windows and storefronts in accordance with applicable codes, and as indicated or scheduled.
  - .1 Unless otherwise specified or indicated, use tempered glass.

## **GLASS AND GLAZING**

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- .6 Insulating Glass Units: Provide units free of the following characteristics:
  - .1 Appearance of condensation between panes.
  - .2 Obstruction of vision at unit perimeter.
  - .3 More than 10 percent measurable deterioration of thermal transmission or shading coefficient values.
  - .4 Chipping, cracking, or breakage of glass panes occurring due to manufacturing defects or under specified service conditions.
  - .5 Migration of edge spacer.

### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Coordination:
  - .1 Coordinate adequate supports in hollow partitions for wall mounted glass with Installers of applicable Sections.

### **1.6 SUBMITTALS FOR REVIEW**

- .1 Product Data:
  - .1 Glass: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
  - .2 Glazing Sealant: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colours.
- .2 LEED Submittals:
  - .1 Product Data:
    - .1 Credit EQ 4.1: For products and materials required to conform to low emission requirements.
- .3 Shop Drawings: For glass indicated to comply with performance requirements, prepare Shop Drawings under direct supervision of a professional engineer.
  - .1 Clearly indicate glass types, configurations, thicknesses, translucent finishes, treatments, coatings, gaskets, hardware and accessories
  - .2 Indicate forces applied to connections at structure and analysis data.
  - .3 Each shop drawing to bear seal and signature of the professional engineer.
- .4 Samples:
  - .1 Submit two samples 300 x 300 mm in size, exemplifying each type of coated glass

## **GLASS AND GLAZING**

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including edge treatment.

- .2 Glazing Accessory Samples: Samples of each type of sealant. For structural glazing sealants, install 300 mm length of sealant between two edges of representative glass samples.
- .5 Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated or scheduled. Include minimum bites or overlaps on glass edges, and minimum edge clearances for glass

### **1.7 SUBMITTALS FOR INFORMATION**

- .1 Manufacturer's Certificate: Certify that glass products conform to requirements.
- .2 Qualifications Data: For manufacturer and Installers. Include proof of adequate facilities and capacity to produce work.

### **1.8 CLOSEOUT SUBMITTALS**

- .1 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

### **1.9 QUALITY ASSURANCE**

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Quality Standards: Perform Work in accordance with:
  - .1 Glazing Contractors Association of B.C (GCA BC) Glazing Systems Specification Manual, supplemented by GANA (Glass Association of North America) Glazing Manual, and GANA Laminated Glazing Reference Manual, for design and fabrication of glazing and installation methods.
  - .2 Insulating Glass Manufacturer's Association of Canada (IGMAC) Glazing Guidelines for Sealed Insulating Glass Units, including requirements for guaranteed service life for manufacture and installation of sealed insulating glass units.
- .3 Manufacturer Qualifications for Insulating-Glass Units: Company with minimum 3 years' experience applying coatings to glass similar to those specified and who is approved and certified by coated-glass manufacturer.
- .4 Installer Qualifications:
  - .1 Glass: Company specializing in performing the work of this section with minimum five years continuous documented experience, and a member in good standing of the GCA BC on projects of similar scope and size, approved by the manufacturer.
- .5 Labelling:

## **GLASS AND GLAZING**

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- .1 Label glass including mirrors with manufacturer's labels identifying glass type and thickness.
- .2 Safety Glazing: Permanently mark glazing with certification label of the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- .3 Insulating Glass Units: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGMAC.

### **1.10 DELIVERY, STORAGE AND HANDLING**

- .1 Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- .2 Minimize storage time of materials at site.
- .3 Minimize handling. Install glass as soon as possible after delivery.
- .4 Store glass at a constant temperature, vertically, blocked off the floor and in a designated clean, dry and dust-free and corrosive contaminant-free interior storage area with adequate air circulation.
- .5 Protect glass from contact with contaminants.

### **1.11 WARRANTIES**

- .1 Glass and Coatings:
  - .1 Provide a ten year manufacturer's warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.
  - .2 Provide a ten year manufacturer's warranty to include coverage for delamination of laminated glass and replacement of same.
  - .3 Provide a ten year warranty to include coverage for colour fading of interlayer and replacement of whole glass units.
  - .4 Provide a ten year manufacturer's warranty to include coverage for reflective coating on mirrors and replacement of same.
  - .5 Commencement of Warranty Period: At date of Substantial Performance.

## **Part 2 Products**

### **2.1 GLASS PRODUCTS – GENERAL**

- .1 Maximum VOC Content: Provide adhesive and sealant products with maximum VOC content in conformance with Credit EQ 4.1.

## **GLASS AND GLAZING**

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- .2 Thickness: **Not less than 9mm unless otherwise noted.** Provide glass in thicknesses as needed to conform to requirements specified.

### **2.2 FLAT GLASS MATERIALS**

- .1 Float Glass: CAN/CGSB-12.3 or ASTM C1036.
- .2 Safety Glass: CAN/CGSB-12.1 or ASTM C1172, and ANSI Z97.1, clear or translucent as indicated, laminated, tempered, or laminated tempered as indicated.
  - .1 Laminated Glass: Two sheets of glass with a fully-bonded, high- impact, UV-resistant, vinyl interlayer. Provide clear interlayer unless otherwise specified or indicated.
    - .1 Interlayer Thickness: 0.030 in.
- .3 Back-Painted Glass: Tempered glass, minimum 6 mm thick, with factory- applied coating on exposed surface of glass and producing an opaque satin finish with seamed edge.
  - .1 Colour: refer to section 08 84353.

### **2.3 INSULATING GLASS UNITS GL-1 and GL-2**

**Argon filled, double pane, argon filled sealed unit c/w tempered glass both sides.**

- .1 General:
  - .1 Thermal Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures specified.
  - .2 U-Factors: Center-of-glazing values, according to CAN/CSA A440.2 by an independent CSA accredited simulator, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
- .2 Insulating Glass Units: CAN/CGSB-12.8, factory assembled, double or triple pane sealed units of clear glass, subject to conformance to requirements, and as follows.
  - .1 Low Emissivity (Low E) Glass Coating: Soft, sputtered, applied to surface#2, unless otherwise indicated. Use hard, pyrolitic coating on second surface for over-size glass units.
  - .2 Interpane Space: Dry hermetic air, kept dry with a dehydrating agent. Use 90 percent argon gas in exterior lites.
  - .3 Edge Seal Construction: Dual seal, silicone foam warm-edge spacer system with high-performance acrylic adhesive structural seal, backed with moisture vapor seal, and designed to maintain hermetic seal. Edge seal colour to be selected by Consultant.

## GLASS AND GLAZING

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- .1 Super Spacer by Edgetech IG.
- .4 Double-Glazed Units Basis-of-Design Product: VNE 1-63 by Viracon Inc, and complying with the following.
  - .1 Total Unit Thickness: 25 mm minimum.
  - .2 U-Factor: 0.29, winter; 0.26, summer.
  - .3 Shading Coefficient: 0.33.
  - .4 Visible Light Transmittance: 62 percent, minimum.

### 2.4 RESERVED

### 2.5 GLASS GL-3 (13mm) 6mm clear pane Interlayer – Safety 0.76mm (0.030”) pvb by Viracon’s 6mm clear pane

### 2.6 GLAZING ACCESSORIES

- .1 Lock Strip Gaskets: ASTM C542, ozone-resistant precision extruded neoprene or EPDM compound. Use gaskets with separate locking strips that are 10-points higher Shore A durometer hardness value than gasket body. Fabricate gaskets in complete units from Shop Drawings or actual site measurements in accordance with recommendations of ASTM C716.
- .2 Setting Blocks: Neoprene, EPDM or silicone, 80 to 90 Shore A durometer hardness tested to ASTM D2240, length of 1 inch (25 mm) for each square metre of glazing or minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height to suit glazing method and pane weight and area. Maximum compression set to ASTM D395 and ASTM C864
- .3 Spacers: Neoprene EPDM or silicone, 40 to 60 Shore A durometer hardness tested to ASTM D2240, minimum 3 inches (75 mm) long x one half the height of the glazing stop x thickness to suit application. Quantity and location in accordance with IGMAC standards and as recommended by the frame and glass manufacturer. Provide face shims when gunable materials or non-shimmed tapes are used. Provide anti-walk edge blocks or side shims in dry glazed frames to limit glass lateral movement
- .4 Glazing Tape: Preformed butyl compound, UV resistant, self-adhering, coiled on release paper, service temperature range of minus 40 to plus 50 degrees C; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; thicknesses as recommended in writing by tape and glass manufacturers for application indicated; colour as selected by Consultant; and in accordance with ASTM C1281 and AAMA 800, and as follows:

## **GLASS AND GLAZING**

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- .1 AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
- .2 AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- .5 Glazing Wedges and Splines: Precision extruded neoprene or EPDM compound, UV resistant, 55 to 65 Shore A durometer hardness, designed for use with pre-shimmed glazing tape, sized to suit glazing channel retaining slot.
- .6 Glass Panel Supports: Concealed, tamper-proof stainless steel fasteners supplemented with tapes and adhesives, as recommended by installer to suit application.
  - .1 Adhesive: Chemically compatible with glass coating and wall substrate.
- .7 Glass Panel Adhesive: Chemically compatible with coating, as recommended by glass manufacturer to suit application.
- .8 Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer, as applicable.
- .9 Structural Silicone Sealant: As specified in Division 07 Section Joint Sealants.

### **2.7 FABRICATION**

- .1 Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, and to comply with system performance requirements.
- .2 Heat-Treated Glass: Fabricate by horizontal (roller-hearth) process with roll- wave distortion parallel to bottom edge of glass as installed.
- .3 Butt-Glazed Glass: Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- .4 Exposed Edges and Corners: Grind smooth and polish exposed glass edges and corners.
- .5 Holes and Cutouts: Provide holes and cutouts to receive hardware fittings and accessories before tempering glass. Provide slight chamfers to exposed glass edges.
- .6 Do not cut or abrade tempered or heat treated glass.
- .7 Provide tempered, laminated, and tempered laminated glass as indicated and as

## **GLASS AND GLAZING**

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required to requirements of applicable code.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verify that openings for glazing are correctly sized and within tolerance.
- .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.
- .3 Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

#### **3.3 GLAZING - GENERAL**

- .1 Maintain minimum face and edge clearances of indicated in Submittals, except where continuous neoprene channel gaskets are used.
- .2 Install glass with air and watertight seals; tapes and sealants continuous, without gaps or ridges; stops secured tightly.
- .3 Install sealant in accordance with manufacturer's written instructions.

#### **3.4 INSTALLATION - STRUCTURAL SILICONE GLAZING**

- .1 Temporarily clamp glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
- .2 Temporarily secure a small diameter non-adhering foamed rod on back side of joint.
- .3 Apply sealant to open side of joint in continuous operation; thoroughly fill the joint without displacing the foam rod. Tool the sealant surface smooth to concave profile.
- .4 Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile. After sufficient cure, remove clamps and fill any gaps in silicone.



## **GLASS AND GLAZING**

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- .5 Remove masking immediately after tooling sealant.
- .6 Seal exterior flush joints at structural silicone conditions with silicone sealant specified.
- .7 Do not apply structural silicone to edges of insulating glass units, or to edges of laminated glass units. Do not adhere to, or place against, the edge of a laminated glass unit interlayer, sealants used as weather seals.

## **GLASS AND GLAZING**

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### **3.5 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)**

- .1 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .2 Place setting blocks at 1/4 points with edge block no more than 150 mm from corners.
- .3 Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- .4 Place glazing tape on free perimeter of glazing in same manner described above.
- .5 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .6 Knife trim protruding tape.

### **3.6 GASKET GLAZING (DRY)**

- .1 Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- .2 Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- .3 Installation with Drive-in Wedge Gaskets: Centre glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centres of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- .4 Installation with Pressure-Glazing Stops: Centre glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- .5 Install gaskets so they protrude past face of glazing stops.

## **GLASS AND GLAZING**

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### **3.7 INSTALLATION – LOCK-STRIP GASKET GLAZING**

- .1 Conform to ASTM C716 and gasket manufacturer's written instructions. Provide supplementary wet seal and weep system unless otherwise indicated.

### **3.8 MANUFACTURER'S FIELD SERVICES**

- .1 Glass and glazing product manufacturers to provide field surveillance of the installation of their Products.
- .2 Monitor and report installation procedures, and unacceptable conditions.

### **3.9 CLEANING**

- .1 Remove glazing materials from finish surfaces immediately, as work progresses.
- .2 Remove non-permanent labels after Work is complete.
- .3 Clean glass and adjacent surfaces using cleaning materials as recommended by applicable manufacturer and non-harmful to surfaces being cleaned.
- .4 Leave glass and adjacent surfaces free of stains and alkaline materials.

### **3.10 PROTECTION OF FINISHED WORK**

- .1 After installation, mark pane with an 'X' by using removable plastic tape or paste. Do not apply markers to glass surfaces.

### **3.11 GLASS SCHEDULE**

- .1 General:
  - .1 Provide glass types as scheduled and in compliance with performance requirements.
  - .2 Provide: 9mm laminated glass for doors.
  - .3 Unless otherwise noted provide heat strengthened or fully tempered glass when required by code.
- .2 Exterior and Interior Storefronts and Doors: Insulating glass units, double- glazed.
- .3 Interior Sliding Glass Doors: Provide 19mm Laminated glass.
- .4 Aluminum Windows: Insulating glass units, double-glazed.

**END OF SECTION**

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## **GYPSUM BOARD ASSEMBLIES**

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### **Part 1      General**

#### **1.1          RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2          SECTION INCLUDES**

- .1 Gypsum board and joint treatment.
- .2 Acoustic insulation.
- .3 Tile backer board.
- .4 Non-load-bearing light gauge metal stud wall framing.
- .5 Ceiling metal framing and wall furrings.
- .6 Shaftwall separations.
- .7 Metal lath for security ceilings.
- .8 Partition head seals.

#### **1.3          RELATED SECTIONS**

- .1 Division 06 Section Miscellaneous Rough Carpentry: Exterior wall sheathing; concealed blocking and plywood to support items attached to or built into gypsum board assemblies.
- .2 Division 07 Section Joint Sealants.
- .3 Division 08 Section Hollow Metal Doors and Frames.
- .4 Division 08 Section Access Doors and Frames: Metal access panels and frames.
- .5 Division 10 Section Toilet Accessories: Product requirements for washroom accessories attached to or built into gypsum board assemblies.
- .6 Divisions 21 to 28: Mechanical and electrical work penetrating gypsum board assemblies.

## **GYPSUM BOARD ASSEMBLIES**

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### **1.4 PRE-INSTALLATION MEETING**

- .1 Convene a pre-installation meeting at Project site minimum three weeks before commencing work of this Section.
- .2 Include parties directly affecting work of this Section, including, board manufacturer's technical representative, and installer's job foreman
  - .1 Review material selections, special details and conditions,
  - .2 Review quality control requirements, required inspections, and certifying procedures.
  - .3 Review and finalizing of construction schedule related to other work affecting installation and verification of availability of materials, installer's personnel, equipment, and facilities required to make progress and avoid delays.
  - .4 Review preparation and installation procedures, quality of execution, and coordination and scheduling required with related work.
  - .5 Review weather and forecasted weather conditions and procedures for coping with unfavourable conditions.
  - .6 Tour, inspect, and discuss conditions, connections to building structure, and other preparatory work performed by other installers.
  - .7 Record and submit copies of minutes including discussions, decisions, agreements, and disagreements to each party attending and concerned parties not in attendance.

### **1.1 PERFORMANCE REQUIREMENTS**

- .1 Structural Performance Requirements:
  - .1 Design assemblies to withstand the loads, including minimum inward and outward design air pressures (lateral loading), and provide structurally sound assemblies, in accordance with applicable code and the authorities having jurisdiction, within the specified deflection limits. Include and comply with the following.
    - .1 Lateral loadings on typical partitions, partitions surrounding stairs, partitions surrounding plenums and air shafts, partitions surrounding atriums,
    - .2 Use minimum inward and outward design air pressures for shaftwall assemblies for elevator shafts as recommended by the elevator manufacturer, and based on elevator velocities and quantities of elevators in each shaft. Include for design loads applied transiently and cyclically under in-service conditions for maximum heights of partitions indicated.
    - .3 Evidence of failure includes deflections exceeding those indicated below, bending stresses causing studs to break or to distort, and end-reaction shear causing runners to bend or to shear and studs to become crippled, and failure of air and smoke-tight seal.

## **GYPSUM BOARD ASSEMBLIES**

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- .2 Maximum Allowable Deflection of Support Framing under Load:
  - .1 Gypsum Board Partitions and Shaftwall Assemblies: Framing not supporting tile, 1/240 of the span in height; framing supporting tile or plaster, 1/360 of the span in height.
  - .2 Gypsum Board Ceilings: 1/360 of the distance between supports.
- .3 Wall Assembly Movement: Design assembly to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
- .2 STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

### **1.2 SUBMITTALS FOR REVIEW**

- .1 Product Data: For gypsum board and backing panels, joint tape, acoustical insulation, partition head seals, corner beads, and edge trim. Indicate locations of use.
- .2 Design Data:
  - .1 Structural Performance: Provide load and deflection data, diagrams, analysis data applicable to specific assemblies indicated, indicating conformance to performance requirements, and signed and sealed by a professional engineer responsible for their preparation.
    - .1 Design Modifications: Indicate design modifications required to meet performance requirements.
- .3 LEED Submittals:
  - .1 Product Data:
    - .1 Credit EQ 4.1 and 4.2: For adhesives and joint compounds required to conform to low emission requirements.
    - .2 Credit MR 4: For gypsum board products required to have recycled content.
    - .3 Product Certificates for Credit MR 5: For products and materials required to conform to requirements for regional materials.
- .4 Samples: Partition head seals.

### **1.3 SUBMITTALS FOR INFORMATION**

- .1 Qualifications Data: For Installer and professional engineer.
- .2 Certificates and Labels: Provide certificate signed by manufacturer of gypsum board for each batch or package of gypsum board indicating that products do not contain specified gases. Label each batch or package with similar information.

## **GYPSUM BOARD ASSEMBLIES**

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### **1.4 QUALITY ASSURANCE**

- .1 Quality Standards: Perform Work in accordance with ASTM C840, and Gypsum Association publications GA-214, GA-216, GA-600, and GA-801, and AWCC (Association of Wall and Ceiling Contractor's of BC) Specification Standards.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience on projects similar in size and scope to this Project.
- .3 Professional Engineer's Qualifications: Structural engineer experienced in design and installation of the specified systems and licensed in the Province where the Project is located.

### **1.5 REGULATORY REQUIREMENTS**

- .1 Fire-Resistance-Rated Assemblies: Where indicated, provide fire rated assemblies identical to that of assemblies tested for fire resistance per ASTM E119 or CAN/ULC-S101, by a testing and inspecting agency acceptable to authorities having jurisdiction.
  - .1 Materials for gypsum board assemblies indicated or specified in fire rated assemblies, are indicative; provide and install materials in strict accordance with the requirements of accepted tested assemblies.

## **Part 2 Products**

### **2.1 MATERIALS - GENERAL**

- .1 Use board materials free of sulphur or similar gases harmful to health or adjacent construction materials, during manufacturing, and in installed products.
- .2 Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
- .3 Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.
- .4 Minimum Recycled Content: Provide gypsum board and steel products with recycled content in conformance with Credit MR 4; gypsum board 95 percent; steel 25 percent.
- .5 Regional Materials: Provide gypsum board products in conformance with Credit MR 5.
- .6 Low Emitting Materials: Provide adhesives and joint compounds with maximum VOC content in conformance with Credits EQ 4.1 and 4.2.



## **GYP SUM BOARD ASSEMBLIES**

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### **2.2 MANUFACTURERS**

- .1 Subject to conformance to requirements provide gypsum board assembly products manufactured by CertainTeed, Georgia Pacific, or CGC.

### **2.3 FRAMING MATERIALS**

#### **2.3.1 DESIGN - GENERAL**

- 1 Have work of this Section designed by a Professional Engineer licensed to design structures and registered in the Province of the Work. Professional Engineer shall review all wall types and suggested framing (stud) thickness and size and confirm for appropriate use. Provide certified shop drawings illustrating wall framing required to meet code compliance.
- 2 Design members and their connections to withstand, within acceptable deflection limitations as specified, their own weight, the weight of gypsum board, finishes, and design loads.
- 3 Design bridging to prevent member rotation and member translation perpendicular to the minor axis. Provide for secondary stress effects due to torsion between lines of bridging.
- 4 Comply with the design and performance requirements of the Building Code and as specified, and design and engineer the work accordingly.
- 5 Base design on Limit States Design principles using factored loads and resistances, determined in accordance with the building code and CAN/CSA- S136.
- 6 Deflection shall not be greater than  $L/600$  of the span between supports.
- 7 Anchors, fasteners and braces shall be structurally stressed not more than 50% of the allowable stress when maximum load conditions are applied.

#### **2.3.2. GENERAL**

- 1 Studs and Tracks - General: ASTM C645; GA-216 and GA-600; galvanized sheet steel, 0.53 mm thick (20 gauge) unless otherwise as indicated, C shape. Provide 0.91 mm thickness (20 gauge) at door openings.
  - A Identification: Colour code steel studs for thickness in accordance with AWCC colour code chart.
- 2 Studs and Tracks – Shaft Wall Assemblies: ASTM C645; galvanized sheet steel.

## **GYPSUM BOARD ASSEMBLIES**

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A Studs: Manufacturer's standard profile for repetitive members, corner and end members, 0.91 mm thick (20 gauge), CH shape unless otherwise indicated.

B Runner Tracks: Manufacturer's standard J-shape track with manufacturer's standard long-leg length, but at least 51 mm long and matching studs in depth, metal thickness matching studs.

3 Furring, Framing, and Accessories: ASTM C645, GA-216 and GA-600, galvanized; steel wire hangers.

A Fasteners: ASTM C514, ASTM C1002, and GA-216.

B Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

C Adhesive: CAN/CGSB-71.25, ASTM C557, and GA-216.

### **2.4 GYPSUM BOARD MATERIALS**

.1 Standard Gypsum Board: ASTM C1396/C1396M, paper-faced, 15.9 mm thick; maximum available length in place; tapered edges, ends square cut.

.2 Fire Rated Gypsum Board: ASTM C1396/C1396M, fire resistive type, UL, ULC, or ITS rated; 15.9 mm thick, maximum available length in place; ends square cut, tapered edges.

.3 Moisture-and Mould-Resistant Gypsum Board: ASTM C1396/C1396M; moisture-and mould-resistant core, paper-faced; 15.9 mm thick, maximum available length in place; ends square cut, tapered edges.

.1 Mould Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

.4 Glass-Mat, Water-Resistant Tile Backer Board: ASTM C1178/C1178M, regular type or Type X core as indicated, with manufacturer's standard edges.

.1 Mould Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

.2 Thickness: As indicated.

.5 Gypsum Shaftliner Board: ASTM C1396/C1396M, manufacturer's proprietary liner panels with moisture-and mould-resistant core and surfaces, thickness as indicated, maximum available size in place; bevelled edges, ends square cut.

### **2.5 ACCESSORIES**

## **GYPSUM BOARD ASSEMBLIES**

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- .1 Acoustic Insulation: Mineral Fibre Insulation conforming to CAN/ULC-S702 Type 1, thickness as indicated. Use insulation free of formaldehyde during manufacturing or when installed.
  - .1 Product: Roxul AFB by Roxul Inc, or comparable product.
- .2 Acoustic Sealant: As specified in Division 07 Section Joint Sealants.
- .3 Acoustical Separation Tape: Closed cell compressible PVC or neoprene foam, self-adhering sealant tape 6 x 38 mm wide, colour black.
  - .1 Product: Norton Norseal by Saint-Gobain, or comparable product.
- .4 Corner Beads: ASTM C1047, metal corner bead.
- .5 Edge Trim: ASTM C1047, GA-216.
  - .1 Type U Casing Bead: J-shaped with exposed short flange that does not receive joint compound.
  - .2 Type LC Casing Bead: J-shaped; exposed long flange receives joint compound.
- .6 Exposed Trim Reveal Mouldings around Openings, and between Adjacent Gypsum Boards: Aluminum, alloy 6063T with chemical conversion coating, reveal profile, depth and width as indicated.
  - .1 Products: Selected from Fry Reglet product range as follows:
    - .1 Snap-In Reveal Moulding.
    - .2 F Profile Reveal Moulding.
- .7 Joint Materials: ASTM C475. Types as recommended for use with specified products as recommended by board and joint treatment materials manufacturers for application indicated.
  - .1 Joint Tape for Interior and Exterior Gypsum Board: Paper reinforcing tape, 50 mm.
  - .2 Joint Compound: Asbestos-free dust-controlled; VOC-free.
- .8 Gypsum Board Fasteners: ASTM C1002, Type S12 W and GA-216.
- .9 Metal Lath for Security Partitions: Unless otherwise noted use Expanded Metal Mesh Flattened expanded steel, diamond pattern, 171 lb/100 sq. ft.
  - .1 Product: 19 mm #9 (10 gauge) FXM by New Metals, Inc, [www.newmetals.com](http://www.newmetals.com).
  - .2 Screws and Washers: Galvanized, with minimal projection from surface of lath. Size screws for 19 mm penetration of framing members.
  - .3 Metal Lath Tie Wire: Galvanized, of type and size to suit application.

## **GYP SUM BOARD ASSEMBLIES**

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- .10 Insulating and Dampproofing Strip: Provide one of the following:
  - .1 Closed cell polyethylene foam strip, 4.7 mm thick, width to suit stud sizes, lengths as required.
    - .1 Product: FoamSealR manufactured by Owens Corning.
  - .2 Closed cell polyvinyl chloride foam tape, non fire rated, compressible, self-adhering, 4.7 mm thick, width to suit stud track size.
    - .1 Product: Norseal V746 (non fire rated), manufactured by Saint Gobain.
  - .3 Self-adhesive Modified Bituminous Sheets: SBS modified bitumen laminated to high-density polyethylene film with release liner on adhesive side, nominal total thickness of 1.0 mm.
    - .1 Product: Sopraseal Stick manufactured by Soprema, or Blueskin SA manufactured by Henry Company.
- .11 Partition Seals: Provide flexible, removable acoustical closures to seals heads of partitions abutting structure, and of design acceptable to Consultant.

### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verify that site conditions are ready to receive work and opening dimensions are as indicated.
- .2 Proceed with installation only after unsatisfactory conditions have been corrected.

## **GYPSUM BOARD ASSEMBLIES**

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### **3.2 METAL STUD INSTALLATION**

- .1 Install studs in accordance with ASTM C754, GA-216, GA-600, AWCC (Association of Wall and Ceiling Contractor's of BC) Specification Standards, and manufacturer's written instructions.
- .2 Install continuous insulating and damp proofing strip under floor tracks.
- .3 Align and secure top and bottom runners at 600 mm on centre.
- .4 Metal Stud Spacing: 400 mm on centre.
- .5 Align stud web openings horizontally.
- .6 Secure studs to tracks using fastener method. Do not weld.
- .7 Stud splicing: Not permissible.
- .8 Fabricate corners using a minimum of three studs.
- .9 Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- .10 Window and Door Opening Framing: Install double studs at opening frame jambs not more than 50 mm from each side of openings. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs.
- .11 Brace stud framing assembly rigid.
- .12 Blocking: Bolt or screw steel channel blocking to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, and equipment.
- .13 Extend stud framing to underside of ceiling or up to structure above, as indicated.
  - .1 Where indicated to extend stud framing to ceiling only, attach ceiling runner securely to acoustic ceiling track, unless otherwise detailed, in accordance with manufacturer's written instructions.
  - .2 Where partitions are indicated with stud framing extending through the ceiling to the structure above, maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
- .14 Coordinate placement of insulation in stud spaces after stud frame erection.
- .15 Install continuous insulating strip to isolate studs from un-insulated surfaces and to

## **GYPSUM BOARD ASSEMBLIES**

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seal perimeter of exterior walls.

### **.16 Acoustic Requirements:**

- .1 Where two studs are erected to form sound-rated partitions, install stud bracing plates linking stud pairs, only at mid-height.
- .2 Provide 6 mm clearance between end of bracing plate and board.

### **3.3 WALL FURRING INSTALLATION**

- .1 Erect furring using indirect method of attachment to concrete walls or similar solid surfaces.
- .2 Erect furring channels horizontally; space maximum 400 mm on centre, unless otherwise indicated, and not more than 100 mm from floor and ceiling lines. Secure in place on alternate channel flanges at maximum 600 mm on centre.

### **3.4 CEILING FRAMING INSTALLATION**

- .1 Install in accordance with ASTM C754, GA-216 and manufacturer's written instructions.
- .2 Coordinate location of hangers with other work.
- .3 Install ceiling framing independent of walls, columns, and above ceiling work.
- .4 Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 600 mm past each end of openings.
- .5 Laterally brace entire suspension system.

### **3.5 METAL LATH INSTALLATION**

- .1 In ceilings where indicated, install metal lath in accordance with ASTM C841.
- .2 Install lath taut and perpendicular to framing members. Stagger end joints of alternate courses. Butt joints tight; maximum gap allowed is 3 mm.
- .3 Lap ends minimum 50 mm. Secure end laps with tie wire at maximum 28 inches 600 mm on centre where they occur between supports.
- .4 Attach metal lath to metal supports using screws with washers or using tie wire, at maximum 600 mm on centre. Engage minimum three strands of mesh.

## **GYPSUM BOARD ASSEMBLIES**

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### **3.6 ACOUSTIC ACCESSORIES INSTALLATION**

- .1 Install acoustic accessories to achieve STC required ratings indicated.
- .2 Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
  - .1 Conform to ASTM C919 and with insulation manufacturer's instructions for closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- .3 Allow for air space within partitions.
- .4 Lay acoustic insulation in ceilings where indicated.
- .5 Install acoustic sealant at gypsum board assembly perimeter as follows:
  - .1 Under Wall Framing: Two beads. Alternatively, install two continuous strips of acoustical separation tape.
  - .2 Base Layer: Seal with 10 mm bead.
  - .3 Face Layer: Seal with 10 mm bead.
  - .4 Seal around perimeters of penetrations of partitions by conduit, pipe, duct work, rough-in boxes. Seal around perimeters of boxes and penetrations in boxes.
- .6 Partition Seals: Install flexible acoustical closures to heads of partitions abutting structure.

### **3.7 GYPSUM BOARD INSTALLATION**

- .1 Install gypsum board in accordance with ASTM C 840, GA-216, GA-600, supplemented by manufacturer's written instructions.
- .2 Install abuse-resistant gypsum board where walls are indicated to receive visual display surface.
- .3 Create reveals around doors and windows and where indicated using reveal mouldings.
- .4 Erect single layer standard gypsum board in most economical direction horizontal vertical, with ends and edges occurring over firm bearing.
- .5 Use screws when fastening gypsum board to metal furring or framing.
- .6 Use nails or screws when fastening gypsum board to wood furring or framing. Staples may only be used when securing the first layer of double layer applications.

## **GYPSUM BOARD ASSEMBLIES**

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- .7 Double Layer Applications: Install double layer gypsum board as follows:
  - .1 Apply gypsum board for first layer, placed perpendicular to framing or furring members.
  - .2 Place second layer with fasteners perpendicular to first layer. Offset joints of second layer from joints of first layer.
- .8 Treat cut edges and holes in moisture resistant gypsum board with sealant.
- .9 Place control joints consistent with lines of building spaces as directed.
- .10 Place corner beads at external corners as indicated. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials as indicated.

### **3.8 TILE BACKER BOARD INSTALLATION**

- .1 Install tile backing board over framing in accordance with manufacturer's written instructions.
- .2 Install with 6 mm gap where panels abut other construction or penetrations.
- .3 Where tile backing boards abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.
- .4 Tape joints and corners, unless otherwise recommended by board manufacturer.

### **3.9 SHAFT WALL ASSEMBLIES**

- .1 General: Install gypsum board shaft wall assemblies to conform to requirements indicated, to manufacturer's written installation instructions, and to ASTM C754 other than stud-spacing requirements.
- .2 Install supplementary framing in gypsum board shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.
- .3 Penetrations: At penetrations in shaft wall, maintain fire rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, and similar items.
- .4 Isolate perimeter of gypsum panels from building structure to prevent cracking of panels.



## **GYPSUM BOARD ASSEMBLIES**

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- .5 Firestop Tracks: Where indicated, install to maintain continuity of fire- resistance-rated assembly indicated.

### **3.10 JOINT TREATMENT**

- .1 Finish in accordance with ASTM C840 or GA-214 to the following levels:

- .1 **Level 1:** Above finished ceilings concealed from view.
- .2 **Level 4:** Walls and ceilings.

- .2 Feather coats on to adjoining surfaces so that camber is maximum 0.8 mm.

### **3.11 TOLERANCES**

- .1 Maximum Variation of Finished Gypsum Board Surface from True Flatness: 3 mm in 3 m in any direction.

**END OF SECTION**

## **RESILIENT BASE**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Resilient wall base.

#### **1.3 RELATED SECTIONS**

- .1 Division 03 Section Cast-in-Place Concrete: Floor substrate surface.
- .2 Division 09 Section Gypsum Board Assemblies: Wall materials to receive application of base.

#### **1.4 SUBMITTALS FOR REVIEW**

- .1 Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colours available.
- .2 Samples: Submit two 300 mm long samples of base material for each colour specified.
- .3 LEED Submittals:
  - .1 Product Data:
    - .1 Credit EQ 4.1: For products required to conform to low emission requirements.
    - .2 Credit MR 4: For products having recycled content.

#### **1.5 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Extra Stock Materials: Provide ten percent of quantity of base of each material in roll format as specified to the Owner, prior to installation.

#### **1.6 QUALITY ASSURANCE**

- .1 Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by the manufacturer.

#### **1.7 DELIVERY, STORAGE, AND PROTECTION**

- .1 Protect roll materials from damage by storing on end unless otherwise specified in manufacturer's instructions.

## RESILIENT BASE

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### 1.8 ENVIRONMENTAL REQUIREMENTS

- .1 Store materials for three days prior to installation in area of installation to achieve temperature stability.
- .2 Maintain ambient temperature required by adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.

### Part 2 Products

#### 2.1 MATERIALS - GENERAL

- .1 Minimum Recycled Content: Provide flooring, base products with recycled content in conformance with Credit MR 4.
- .2 Low Emitting Materials: Provide adhesives with maximum VOC content in conformance with Credit EQ 4.1.

#### 2.2 WALL BASE

- .1 Resilient Strip Rubber Base: Type and manufacture as indicated in Product and Finish Schedules, or comparable products by:
  - .1 Roppe Corporation, USA.
  - .2 Burke Mercer Flooring Products, Division of Burke Industries Inc.
  - .3 Flexco.
- .2 Comply with the Following:
  - .1 Lengths: Coils in minimum 120-foot lengths.
  - .2 Corners: Job formed inside and outside corners.

#### 2.3 ADHESIVES

- .1 Adhesives: Water and alkali resistant, types recommended by base manufacturer.

### Part 3 Execution

#### 3.1 EXAMINATION

- .1 Verify wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.
- .2 Verify that finishes of substrates comply with tolerances and other requirements

## **RESILIENT BASE**

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specified in other Sections and that substrates are free of cracks, ridges, depressions, and scale.

- .3 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- .1 Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- .2 Clean substrates to be covered by resilient products immediately before installation.

### **3.3 INSTALLATION**

- .1 Install wall base in accordance with manufacturer's installation guide.
- .2 Install in longest practical lengths. Minimize number of joints. Fit joints tight and vertical.
- .3 Mitre internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold.
- .4 Install base on solid backing. Bond tight to wall and floor surfaces.
- .5 Scribe and fit to door frames and other interruptions.

### **3.4 CLEANING**

- .1 Clean and wash dry installed work.
- .2 Remove excess adhesive from base, and wall surfaces without damage.

**END OF SECTION**

## **PAINTING**

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### **Part 1 General**

#### **1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SECTION INCLUDES**

- .1 Surface preparation and site application of exterior and interior paints and coatings.
- .2 Instructions to complete other Sections containing priming and painting specifications.

#### **1.3 RELATED SECTIONS**

- .1 Division 05 Section Structural Steel.
- .2 Division 05 Section Metal Fabrications.
- .3 Division 07 Section Joint Sealants.
- .4 Division 08 Hollow Metal Doors and Frames.
- .5 Division 08 Section Wood Doors.
- .6 Division 09 Section Access Flooring: Floor sealing of access flooring.
- .7 Division 23 Section Mechanical Identification.
- .8 Division 26 Section Electrical Identification.

#### **1.4 SUBMITTALS FOR REVIEW**

- .1 Product Data: Provide data for each painting product including VOC content.
- .2 LEED Submittals:
  - .1 Product Data:
    - .1 Credit EQ 4.2: For paints and coatings required to conform to low emission requirements.
  - .3 Samples: Submit two samples, 200 x 200 mm in size illustrating range of colours and textures available for each colour selected.

## **PAINTING**

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- .4 Product List: For each product specified, include the following:
  - .1 Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
  - .2 Printout of current MPI Approved Products List for each product category specified in Part 2, with the proposed product highlighted.

### **1.5 SUBMITTALS FOR INFORMATION**

- .1 Qualification Data: For Installer.
- .2 Installation Data: Manufacturer's special installation requirements indicating special surface preparation procedures, substrate conditions requiring special attention.
- .3 Product Certificates: For each type of paint or coating not specified to conform to an MPI-listed product or system, provide a certificate signed by the paint or coating manufacturer. Include statements certifying that surfaces and conditions for each paint or coating system application, supervision, and inspection are approved, and conformance to the manufacturer's specifications.
- .4 Notice for MPI Inspections: Upon award of contract, apply to MPI for engagement of MPI Inspector to review Project documents prior to commencement of work, and to perform field inspections and tests.
  - .1 Provide copies of Project painting specification including list of proposed paint materials, plans, elevations, details, finish and colour schedule and Finish Schedule, prior to commencement of work.
  - .2 Inspector will submit review of documents prior to commencement of work.
  - .3 Make corrections required by Inspector.
- .5 Field quality control reports.

### **1.6 CLOSEOUT SUBMITTALS**

- .1 Record Documentation:
  - .1 Paint colour schedule including, manufacturer, paint types and colour codes.

### **1.7 MAINTENANCE MATERIAL SUBMITTALS**

- .1 Extra Stock Materials:
  - .1 Provide 4 L of each colour, type and texture.
  - .2 Label each container with colour, paint colour code, type, texture, room locations in addition to the manufacturer's label.

## **PAINTING**

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### **1.8 QUALITY ASSURANCE**

- .1 Conform to MPI (Master Painters Institute) Architectural Painting Specifications Manual, Premium grade, unless otherwise specified.
- .2 Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

### **1.9 REGULATORY REQUIREMENTS**

- .1 Conform to applicable code for flame and smoke rating requirements for finishes.

### **1.10 MOCK-UP**

- .1 Provide 2 x 2 m wide field sample panel upon request by architect, illustrating coating colour, texture, and finish.
- .2 Locate where directed by Consultant.
- .3 Approved mock-up may remain as part of the Work.

### **1.11 DELIVERY, STORAGE, AND PROTECTION**

- .1 Deliver products to site in sealed and labelled containers; inspect to verify acceptability.
- .2 Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, colour designation, and written instructions for mixing and reducing.
- .3 Store paint materials at minimum ambient temperature of 7 degrees C and a maximum of 32 degrees C, in ventilated area, and in accordance with manufacturer's written instructions.

### **1.12 ENVIRONMENTAL REQUIREMENTS**

- .1 Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- .2 Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- .3 Minimum Application Temperatures for Latex Paints: 7 degrees C for interiors; 10 degrees C for exterior; unless otherwise required by manufacturer's written instructions.
- .4 Minimum Application Temperature for Varnish Finishes: 18 degrees C for interior or

## **PAINTING**

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exterior, unless otherwise required by manufacturer's written instructions.

- .5 Provide lighting level of 860 lx measured mid-height at substrate surface.
- .6 Provide safe and adequate ventilation when toxic and/or volatile/flammable materials are being used.

### **Part 2 Products**

#### **2.1 MATERIALS - GENERAL**

- .1 Exterior Paints: Exterior paint product selection of overall life cycle performance shall take precedence over VOC content.
- .2 Interior Paints: Use only low odour, low VOC, paint products having a minimum E3 MPI rating and conforming to Credit EQ 4.2. Refer to Product and Finish Schedules

#### **2.2 MATERIALS**

- .1 Coatings: Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.
- .2 Primers, Paints, Coatings, Varnishes, Stains, Lacquers and Fillers: Use only materials listed in MPI Approved Product List (APL), and Green Approved Products List, subject to life cycle performance requirements.
- .3 Single Source Responsibility: Use paint products from a single manufacturer for each paint system.
- .4 Use materials lead and mercury-free and with low VOC content to greatest extent possible.
- .5 Coatings: Ready mixed, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.
- .6 Accessory Materials: Provide commercial quality linseed oil, shellac, turpentine, paint thinners and other materials to achieve the finishes specified.
- .7 Paint Colours: Location and number of colours as indicated. Colours as selected by Consultant.



## **PAINTING**

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### **Part 3 Execution**

#### **3.1 EXAMINATION**

- .1 Verify surfaces and substrate conditions are ready to receive work as instructed by the product manufacturer.
- .2 Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- .3 Test shop applied primer for compatibility with subsequent cover materials.
- .4 Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
  - .1 Gypsum Wallboard: 12 percent.
  - .2 Concrete: 12 percent.
  - .3 Interior Wood: 15 percent, measured in accordance with ASTM D2016.
  - .4 Exterior Wood: 15 percent, measured in accordance with ASTM D2016.
  - .5 Concrete Floors: 8 percent.
- .5 Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PROTECTION**

- .1 Protect surrounding or adjoining work by adequately covering with tarpaulins or other protective covering; make good any damage caused by failure to provide suitable protection.
- .2 Before commencing work, remove all electrical plates, surface hardware, light fixture canopies, etc. and replace in original condition at completion of painting of each space.
- .3 Do not use solvent or thinners that will damage permanent lacquer finishes on hardware to clean these items.
- .4 Wrap knobs and remove escutcheons during painting work. Cover all hardware such as strikes, butts, door closers, push and pull plates, etc.

#### **3.3 PREPARATION**

- .1 Prepare surfaces in accordance referenced standards. Preparation substrates as required for acceptance of painting, including cleaning, small crack repair, patching, caulking, and make good surfaces and areas in accordance with referenced MPI standard.
- .2 Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and

## **PAINTING**

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fittings prior to preparing surfaces or finishing.

- .3 Correct defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface defects.
- .4 Seal with shellac and seal marks which may bleed through surface finishes.
- .5 Impervious Surfaces: Remove mildew by scrubbing with solution of tri- sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- .6 Aluminum Surfaces Scheduled for Paint Finish: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- .7 Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
- .8 Concrete Floors: Remove contamination, acid etch and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- .9 Copper Surfaces Scheduled for a Paint Finish: Remove contamination by steam, high pressure water, or solvent washing. Apply vinyl etch primer immediately following cleaning.
- .10 Copper Surfaces Scheduled for a Natural Oxidized Finish: Remove contamination by applying oxidizing solution of copper acetate and ammonium chloride in acetic acid. Rub on repeatedly for required effect. Once attained, rinse surfaces with clear water and allow to dry.
- .11 Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.
- .12 Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- .13 Concrete Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- .14 Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand, power tool, wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

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- .15 Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Prime metal items including shop primed items.
- .16 Interior Wood Items Scheduled to Receive Paint Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.
- .17 Interior Wood Items Scheduled to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats.
- .18 Exterior Wood Scheduled to Receive Paint Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied.
- .19 Exterior Wood Scheduled to Receive Transparent Finish: Remove dust, grit, and foreign matter; seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes with tinted exterior calking compound after sealer has been applied.
- .20 Glue-Laminated Beams and Structural Wood: Prior to finishing, wash surfaces with solvent, remove grease and dirt.
- .21 Wood and Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

### **3.4 APPLICATION**

- .1 Apply products in strict accordance with manufacturer instructions.
- .2 Do not apply finishes to surfaces that are not dry.
- .3 Apply each coat to uniform finish.
- .4 Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- .5 Sand wood and metal lightly between coats to achieve required finish.
- .6 Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
- .7 Allow applied coat to dry before next coat is applied.
- .8 Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- .9 Prime concealed surfaces of interior and exterior woodwork with primer paint.

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### **3.5 FINISHING PLUMBING, MECHANICAL, SPRINKLER AND ELECTRICAL EQUIPMENT**

- .1 Colour code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Colour band and identify with flow arrows, names and numbering.
  - .1 Refer to Division 23 and Division 26 for schedule of colour coding and identification banding of equipment, duct work, piping, and conduit.
- .2 Paint shop-primed equipment. Paint shop prefinished items occurring at interior areas.
- .3 Remove unfinished louvres, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- .4 Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets and collars and supports in finished areas, including in mechanical and electrical equipment rooms, except where items are prefinished.
- .5 Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvres with one coat of flat black paint, to visible surfaces. Paint dampers exposed behind louvres, grilles, and convector and baseboard cabinets to match face panels.
- .6 Paint exposed conduit and electrical equipment occurring in finished areas.
- .7 Minimize use of paint as much as possible.
- .8 Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
- .9 Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

### **3.6 FIELD QUALITY CONTROL**

- .1 Engage paint inspector acceptable to the Consultant and the Master Painters Institute to test and inspect work during progress of installation.
- .2 Notify paint inspector minimum one week prior to commencement of work.
- .3 Provide paint inspector copies of painting specification and drawings.
- .4 Inspections and Tests:
  - .1 Inspect defects and problems prior to commencement of work, and after prime coat applications.

## **PAINTING**

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- .2 Dry film thickness testing.
- .5 Prepare reports noting defects and problems

### **3.7 CLEANING**

- .1 Clean installed work.
- .2 Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

### **3.8 SCHEDULE - EXTERIOR SURFACES**

- .1 Shop Primed Steel:
  - .1 EXT 5.1T.: Pigmented polyurethane and self-priming epoxy.
- .2 Galvanized Metal, Shop Primed:
  - .1 EXT. 5.3B: Alkyd finish, semi-gloss, for use on low contact and low traffic areas.
  - .2 EXT 5.3D: Polyurethane, pigmented finish over vinyl wash and epoxy primer, for use on high contact and high traffic areas.

### **3.9 SCHEDULE - INTERIOR SURFACES**

- .1 Metal Mechanical and Electrical Cabinets, Sprinkler Pipes and Conduit:
  - .1 Water-based, light industrial coating over water-based primer.
  - .2 Covered and Insulated Pipes and Ducts: Three coats; one coat PVA sealer, two coats enamel semi-gloss.
  - .3 Other Items: One coat red oxide primer; use galvanized primer where applicable. Two coats enamel semi gloss..
  - .4 Match room colour in which piping or ductwork is exposed, unless otherwise directed or scheduled.
- .2 Dressed Lumber, Wood Doors, Wood Trim, MDF Panels – Paint Finish:
  - .1 High performance architectural latex, semi-gloss.
- .3 Gypsum Board:
  - .1 Semi-gloss for walls; Flat for all ceiling types.

**END OF SECTION**

**STAINING AND TRANSPARENT FINISHING**

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**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of stains and transparent finishes.

**1.02 RELATED REQUIREMENTS**

- A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 099113 - Exterior Painting: Stains and transparent finishes for concrete substrates.
- C. Section 099123 - Interior Painting: Stains and transparent finishes for concrete substrates.

**1.03 DEFINITIONS**

- A. Comply with ASTM D16 for interpretation of terms used in this section.

**1.04 REFERENCE STANDARDS**

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications 2016.
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials 2020.
- D. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board 2007.
- E. SCAQMD 1113 - Architectural Coatings 1977 (Amended 2016).

**1.05 SUBMITTALS**

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
  - 1. Manufacturer's name, product name and/or catalog number, and general product category.
  - 2. Manufacturer's installation instructions.
  - 3. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
- C. Samples: Submit two samples, illustrating selected colors and sheens for each system with specified coats cascaded. Submit on actual wood substrate to be finished, \_\_\_\_x\_\_\_\_ inch (\_\_\_\_x\_\_\_\_ mm) in size.

[Type here]

- D. Certification: By manufacturer that stains and transparent finishes comply with VOC limits specified.
- E. Manufacturer's Instructions: Indicate special surface preparation procedures.
- F. Manufacturer's Qualification Statement.
- G. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, safety data sheets (SDS), care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 016000 - Product Requirements, for additional provisions.
  - 2. Extra Stain and Transparent Finish Materials: 1 gallon (3.78 L) of each color and type; from the same product run, store where directed.
  - 3. Label each container with color and type in addition to the manufacturer's label.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of stain or transparent finish, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Stain and Transparent Finish Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

#### **1.08 FIELD CONDITIONS**

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by manufacturer of stains and transparent finishes.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply materials when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F (3 degrees C) above the dew point; or to damp or wet surfaces.
- D. Minimum Application Temperature: 50 degrees F (10 degrees C) unless required otherwise by manufacturer's instructions.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Provide finishes used in any individual system from the same manufacturer; no exceptions.
- B. Provide finishes from the same manufacturer to the greatest extent possible.
  - 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
  - 2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
- C. Transparent Finishes:

[Type here]

1. PPG Paints; [\_\_\_\_]: [www.ppgpaints.com/#sle](http://www.ppgpaints.com/#sle).
- D. Stains:
  1. PPG Paints; [\_\_\_\_]: [www.ppgpaints.com/#sle](http://www.ppgpaints.com/#sle).

## **2.02 STAINS AND TRANSPARENT FINISHES - GENERAL**

- A. Finishes:
  1. Provide finishes capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
  2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
  3. Supply each finish material in quantity required to complete entire project's work from a single production run.
  4. Do not reduce, thin, or dilute finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 016116.
- C. Volatile Organic Compound (VOC) Content:
  1. Provide stains and transparent finishes that comply with the most stringent requirements specified in the following:
    - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
    - b. SCAQMD 1113 Rule.
    - c. CARB (SCM).
    - d. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings; [www.otcair.org](http://www.otcair.org); specifically:
      - 1) Opaque, Flat: 50 g/L, maximum.
      - 2) Opaque, Nonflat: 150 g/L, maximum.
      - 3) Opaque, High Gloss: 250 g/L, maximum.
      - 4) Varnishes: 350 g/L, maximum.
    - e. Architectural coatings VOC limits of the State in which the Project is located.
    - f. Architectural coatings VOC limits of State in which the project is located.
    - g. USGBC LEED Rating System; for interior wall and ceiling finish (all coats), clear wood stains and finishes, sanding sealers, other sealers, shellac, and floor coatings.
  2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- D. Flammability: Comply with applicable code for surface burning characteristics.
- E. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

## **2.03 EXTERIOR STAIN AND TRANSPARENT FINISH SYSTEMS**

- A. Finish on Wood:
  1. Stain: Exterior Solid Stain for Wood, Water Based.
    - a. Products:
      - 1) PPG Paints Flood Pro Series Solid Color Stain, FLD820 Series.
      - 2) PPG Paints ProLuxe Premium Solid Wood Finish, SIK710 Series, Matte.
  2. Stain: Exterior Semi-Transparent Stain for Wood, Water Based.
    - a. Products:



[Type here]

- 1) PPG Paints Flood Pro Series Semi-Transparent Acrylic/Oil Stain, FLD812 Series.
  - 2) PPG Paints ProLuxe SRD Semi-Transparent Wood Finish, SIK500-190, Matte.
3. Stain: Exterior Semi-Transparent Stain for Wood, Solvent Based.
  - a. Products:
    - 1) PPG Paints Flood Pro Series Semi-Transparent Alkyd/Oil Stain, FLD802 Series.
4. Stain: Exterior Semi-Transparent Stain for Wood Decks, Solvent Based or Water Based.
  - a. Products:
    - 1) PPG Paints Flood Pro Series Semi-Transparent Alkyd/Oil Stain, FLD802 Series.
    - 2) PPG Paints Flood Pro Series Semi-Transparent Acrylic/Oil Stain, FLD812 Series.
    - 3) PPG Paints ProLuxe SRD Semi-Transparent Wood Finish, SIK500-190, Matte.

#### **2.04 INTERIOR STAIN AND TRANSPARENT FINISH SYSTEMS**

- A. Finish on Wood - Vertical Surfaces:
  1. Sealer: Lacquer, Sanding Sealer, Clear.
    - a. Products:
      - 1) PPG Paints Speedline High Build Clear Lacquer Sanding Sealer, 77-9100.
  2. Sealer: Lacquer, Sanding Sealer, White.
    - a. Products:
      - 1) PPG Paints Speedline White Lacquer Undercoat, 77-9610.
      - 2) PPG Paints Speedline Premium White Lacquer Undercoat, 77-9600.
  3. Top Coat(s): Clear Lacquer.
    - a. Products:
      - 1) PPG Paints Speedline High Build Clear Lacquer, 77-9130, Satin.
      - 2) PPG Paints Speedline High Build Clear Lacquer, 77-9120, Semi-Gloss.
      - 3) PPG Paints Speedline High Build Clear Lacquer, 77-9110, Gloss.
  4. Top Coat(s): Pigmented Lacquer.
    - a. Products:
      - 1) PPG Paints Speedline Pigmented White Lacquer Finish, 77-9730, Satin.
      - 2) PPG Paints Speedline Pigmented White Lacquer Finish, 77-9720, Semi-Gloss.
      - 3) PPG Paints Speedline Pigmented White Lacquer Finish, 77-9710, Gloss.

#### **2.05 ACCESSORY MATERIALS**

- A. Accessory Materials: Cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of finished surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin application of stains and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
  - 1. Wood: 15 percent, measured in accordance with ASTM D4442.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or repair existing finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- G. Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.
- H. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

### **3.03 APPLICATION**

- A. Apply products in accordance with manufacturer's written instructions.
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- D. Sand wood surfaces lightly between coats to achieve required finish.
- E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- F. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- G. Reinstall items removed prior to finishing.

### **3.04 FIELD QUALITY CONTROL**

- A. See Section 014000 - Quality Requirements, for general requirements for field inspection.

[Type here]

B. Inspect and test questionable coated areas in accordance with [\_\_\_\_\_].

**3.05 CLEANING**

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

**3.06 PROTECTION**

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

**END OF SECTION**

## **Section No. 7**

# **LIST OF DRAWINGS**









EXTERIOR WALL ASSEMBLIES						
TYPE	FIRE RATING	MIN. REQ'D RSI	PROP. RSI VALUE	DIAGRAM	DESCRIPTION	RSI
W1	N/A	2.30 + 1.8 ci	2.5 + 1.9 ci		STONE WALL W/ METAL STUD BACKUP - HEATED SPACE • LIMESTONE VENEER • 25mm AIRSPACE • 52mm ROCKWOOL COMFORTBOARD 80 • SELF-ADHESIVE VAPOUR PERMEABLE AIR BARRIER • 19mm SHEATHING • 102mm METAL STUD @ 400 O.C. • 89mm ROCKWOOL BATT INSULATION • VAPOUR BARRIER • 13mm GWS ***** TOTAL	0.0004 x 100 = 0.04 0.18 1.48 0.03 0.17 2.3 0.12 0.08 2.5 + 1.9ci
W2	N/A	N/A	N/A		EXTERIOR LIMESTONE WALL - UNHEATED SPACE • LIMESTONE VENEER • 25mm MIN. AIRSPACE • SELF-ADHESIVE VAPOUR PERMEABLE AIR BARRIER • 19mm SHEATHING • 102mm METAL STUDS EXTENDED TO U/S OF STRUCTURE • 89mm ROCKWOOL BATT INSULATION • VAPOUR BARRIER • 13mm TILE BACKER BOARD • 19mm TILE • FINISH AS NOTED	---
W3	1HR	2.30 ci	2.3 ci		STONE WALL W/ CMU BACKUP - HEATED SPACE • LIMESTONE VENEER • 25mm AIRSPACE • 52mm ROCKWOOL COMFORTBOARD 80 • SELF-ADHESIVE VAPOUR PERMEABLE AIR BARRIER • 140mm CMU ***** TOTAL	0.0004 x 100 = 0.04 0.18 1.48 0.03 0.004 x 140 = 0.56 2.3ci
W4	N/A	N/A	N/A		NEW ALUMINUM PANEL CLAD WALL W/ 4" STEEL STUD BACKUP • ALUMINUM PANEL (MTL-2) W/ VERTICAL L-ANGLES • 25mm AIRSPACE MIN. • SELF-ADHESIVE VAPOUR PERMEABLE AIR BARRIER • 19mm PLYWOOD SHEATHING • 102mm STEEL STUD @ 300mm O.C. • 89mm ROCKWOOL INSULATION R-14 • VAPOUR BARRIER • 13mm GWS • FINISH AS NOTED	FRR AS PER CBC SB-2 TABLE 2.1.1
W5	N/A	2.30 + 1.8 ci	2.4 + 1.86 ci		NEW ALUMINUM PANEL CLAD WALL W/ 4" STEEL STUD BACKUP • ALUMINUM PANEL (MTL-2) W/ VERTICAL L-ANGLES • 25mm AIRSPACE MIN. • 52mm ROCKWOOL COMFORTBOARD 80 • SELF-ADHESIVE VAPOUR PERMEABLE AIR BARRIER • 19mm PLYWOOD SHEATHING • 102mm STEEL STUD @ 300mm O.C. • 89mm ROCKWOOL BATT INSULATION • VAPOUR BARRIER • 13mm GWS • FINISH AS NOTED ***** TOTAL	--- 0.18 1.48 0.03 0.17 2.3 0.03 0.08 2.4 + 1.86ci
W6	N/A	N/A	N/A		NEW ALUMINUM PANEL CLAD WALL AT DORMER W/ 4" STEEL STUD BACKUP • ALUMINUM PANEL (MTL-2) W/ VERTICAL L-ANGLES • 13mm PLYWOOD SHEATHING • 102mm STEEL STUD @ 300mm O.C. • 13mm PLYWOOD SHEATHING • ALUMINUM PANEL (MTL-2) W/ VERTICAL L-ANGLES	---
W7	1HR	2.30 ci	2.81 ci		ALUMINUM PANEL W/ CMU BACKUP - HEATED SPACE • ALUMINUM PANEL (MTL-2) W/ VERTICAL L-ANGLES • 25mm AIRSPACE MIN. • 76mm ROCKWOOL COMFORTBOARD 80 • SELF-ADHESIVE VAPOUR PERMEABLE AIR BARRIER • 140mm CMU ***** TOTAL	--- --- 2.22 0.03 0.004 x 140 = 0.56 2.81 ci

NOTES:  
 • MINIMUM RSI VALUES BASED ON SB-10 DIVISION 2 TABLE 5.5-5 for climate zone 5; W2/W4 EXEMPTED FROM SB-10 REQUIREMENTS BY SB-10 DIV. 2, 1.2.1.1 (d)

## DOOR & FRAME SCHEDULE

DOOR NUMBER	ROOM NAME	DOOR OPENING					FRAME				DOOR				REMARKS
		DOOR REBATE WIDTH	DOOR REBATE HEIGHT	DOOR THICKNESS	FIRE RESISTANCE RATING	NO. LEAVES	FRAME TYPE	JAMB DETAIL	MATERIAL	FINISH	DOOR TYPE	MATERIAL	FINISH	IN/EXT	
D101	UNCONDITIONED VEST.	1830	±2760	45	0	2	A	A	AL	CA	A	GLZ	CA	EXT	AUTOMATIC SLIDING DOORS WITH TRANSDOM AND SIDELITE
D103A	SEASONAL TICKET OFF.	915	±2620	45	0	1	B	B	AL	PT-2	C	AL	PT-2	EXT	PROVIDE ELEC STRIKE FOR FUTURE FOB BY OTHERS
D103B	SEASONAL TICKET OFF.	915	±2620	45	45 MIN.	1	C	C	AL	PT-2	C	HM	PT-2	EXT	PROVIDE ELEC STRIKE FOR FUTURE FOB BY OTHERS
D104	HUB / ELEC ROOM	915	±2620	45	45 MIN.	1	B	C	HM	PT-2	B	HM	PT-2	INT	
D105	MECH ROOM	915	±2620	45	45 MIN.	1	B	C	HM	PT-2	B	HM	PT-2	INT	
NOTES: <ul style="list-style-type: none"><li>REFER TO SCHEDULE, SPECIFICATIONS, AND ELECTRICAL FOR HARDWARE REQUIREMENTS.</li><li>REFER TO FINISH SCHEDULE FOR PAINT COLOURS.</li></ul>															

NOTES:  
 • REFER TO SCHEDULE, SPECIFICATIONS, AND ELECTRICAL FOR HARDWARE REQUIREMENTS.  
 • REFER TO FINISH SCHEDULE FOR PAINT COLOURS.

## HARDWARE SCHEDULE

DOOR NUMBER	ROOM NAME	HANDLE		LOCK				REMARKS
		STYLE	FINISH	LOCK TYPE	CLOSER	PDO	FOB	
D101	UNCONDITIONED VEST.	N/A	CA	STD	N	N	N	AUTOMATIC SLIDING DOOR C/W SLIDING DOOR EQUIPMENT WITH INTEGRATED ELECTRONIC LOCKS - REFER TO SCHEDULE & ELEC
D103A	SEASONAL TICKET OFF.	STANLEY BEST 9K	626	CYL	Y	Y	N	ENTRANCE FUNCTION, R/I FOR FUTURE FOB
D103B	SEASONAL TICKET OFF.	STANLEY BEST 9K	626	CYL	N	N	N	ENTRANCE FUNCTION, R/I FOR FUTURE FOB
D104	HUB ROOM	STANLEY BEST 9K	626	SFL	Y	N	N	
D105	ELEC ROOM	STANLEY BEST 9K	626	SFL	Y	N	N	
NOTES: <ul style="list-style-type: none"><li>REFER TO ELECTRICAL FOR PDO / ELECTRICAL HARDWARE REQUIREMENTS.</li></ul>								

NOTES:  
 • REFER TO ELECTRICAL FOR POD / ELECTRICAL HARDWARE REQUIREMENTS.

FLOOR ASSEMBLIES						
TYPE	FIRE RATING	MIN. REQ'D RSI	PROP. RSI VALUE	DIAGRAM	DESCRIPTION	RSI
F1	N/A	2.64 FOR 600mm + 0.88ci BELOW	2.78 ci		INSULATED SLAB ON GRADE • FINISH AS NOTED • POURED IN PLACE CONCRETE SLAB, REFER TO STRUCTURAL • 6mm POLY VAPOUR BARRIER • 76mm XPS RIGID INSULATION • 150mm GRANULAR "A" ***** TOTAL	--- 0.12 2.66 --- 2.78
F2	N/A	N/A	N/A		DEPRESSED SLAB ON GRADE • FINISH AS NOTED • DEPRESSED POURED IN PLACE CONCRETE SLAB, REFER TO STRUCTURAL • 6mm POLY VAPOUR BARRIER • 52mm XPS RIGID INSULATION • 150mm GRANULAR "A"	---
F3	N/A	N/A	N/A		SLAB ON GRADE • FINISH AS NOTED • POURED IN PLACE CONCRETE SLAB, REFER TO STRUCTURAL • 6mm POLY VAPOUR BARRIER • 150mm GRANULAR "A"	---
F4	N/A	N/A	N/A		SIDEWALK SLAB • 150mm CONCRETE SLAB 25 MPa + 8% AIR C/W BROOM FINISH DE-ICE RADIANT PIPING, REFER TO MECHANICAL DRAWINGS • 6mm POLY VAPOUR BARRIER • 50mm XPS RIGID INSULATION • 150mm GRANULAR "A"	---

NOTES:  
 • MINIMUM RSI VALUES BASED ON SB-10 DIVISION 4 TABLE 1.1.1.2; F2/F3 EXEMPTED FROM SB-10 REQUIREMENTS BY SB-10 DIV. 2, 1.2.1.1 (d)

## PARTITION ASSEMBLIES

TYPE	FIRE RATING	DIAGRAM	DESCRIPTION
P1	1 HR		OFFICE SPACE MECH SPACE FRR AS PER CBC SB-2 TABLE 2.1.1
P2	1 HR		INTERIOR WALL • FINISH AS NOTED • 13mm GWS LAMINATED TO CMU U.O.N. • 90mm CMU TO U/S OF ROOF STRUCTURE • FINISH AS NOTED

FRR AS PER CBC SB-2 TABLE 2.1.1

FRR AS PER CBC SB-2 TABLE 2.1.1

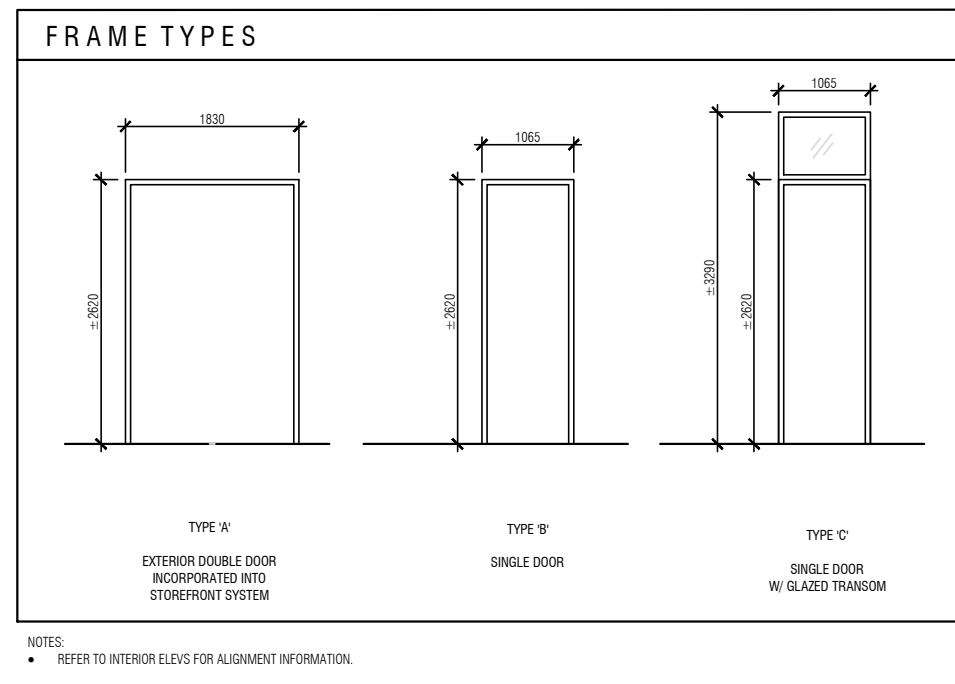
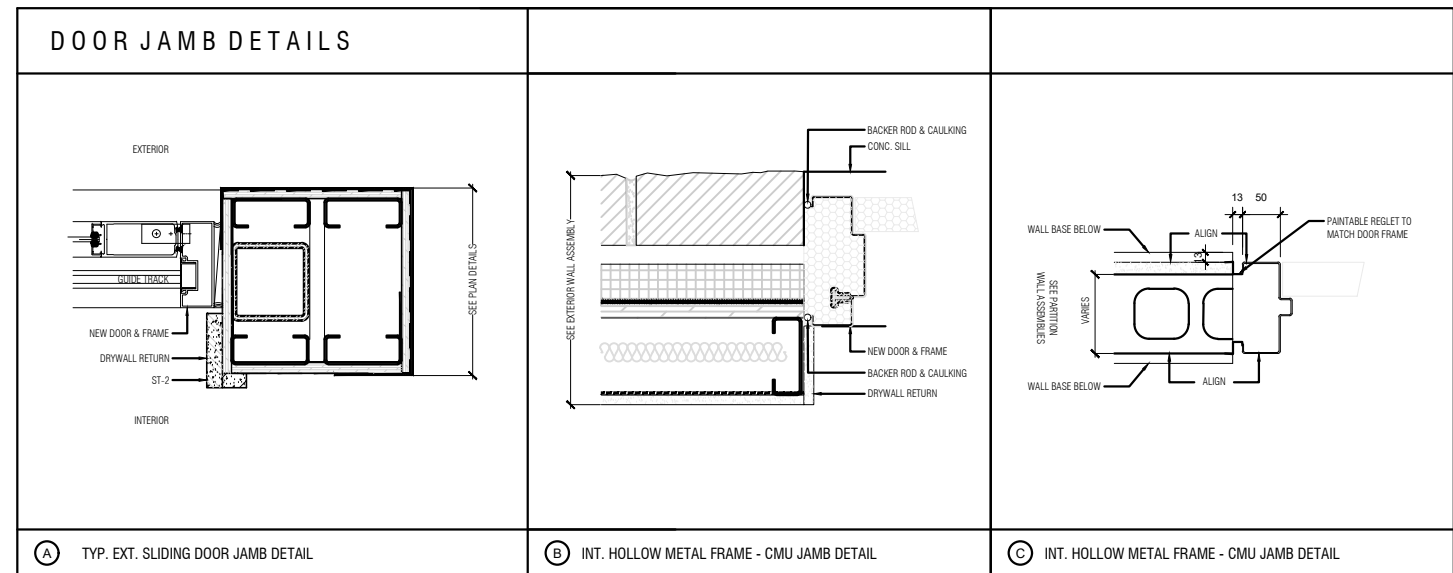
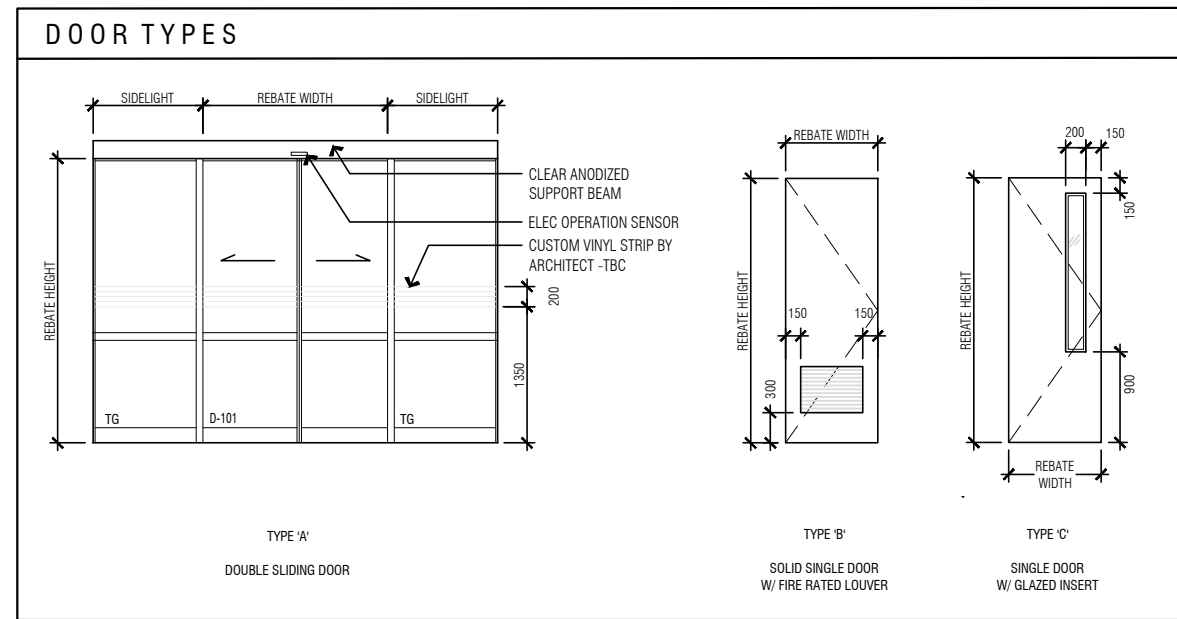
CEILING ASSEMBLIES						
TYPE	FIRE RATING	MIN. REQ'D RSI	PROP. RSI VALUE	DIAGRAM	DESCRIPTION	RSI
C1	N/A	8.6	8.736		GWS CEILING • HANGERS AS REQUIRED • 25mm MIN. AIR CAVITY • 2 x R-24 ROCKWOOL COMFORTBATT INS. • VAPOUR BARRIER • 13mm GWS • FINISH AS NOTED ***** TOTAL	--- 0.16 8.46 0.11 0.006 --- 8.736
C2	N/A	N/A	N/A		WOOD CEILING • HANGERS AS REQUIRED • METAL STUDS @ 600mm • T&G DOUGLAS FIR W/ CONCEALED FASTENERS • FINISH AS NOTED	---

NOTES:  
 • MINIMUM RSI VALUES BASED ON SB-10 DIVISION 2 TABLE 5.5-5

## ROOF ASSEMBLIES

TYPE	FIRE RATING	MIN. REQ'D RSI	PROP. RSI VALUE	DIAGRAM	DESCRIPTION
R1	N/A	N/A	N/A		SLOPED ROOF • STANDING SEAM METAL ROOF • SELF-ADHESIVE AVB • 19mm T&G PLYWOOD SHEATHING • WOOD TRUSSES @ 600mm O.C. - REFER TO STRUCTURAL • CEILING FINISH AS NOTED
R2	N/A	N/A	N/A		FLAT ROOF • STANDING SEAM METAL ROOF • SELF-ADHESIVE AVB SUITABLE FOR A FLAT ROOF • 19mm T&G PLYWOOD SHEATHING • WOOD TRUSSES @ 600mm O.C. - REFER TO STRUCTURAL • CEILING FINISH AS NOTED

1 ASSEMBLIES  
 1/10/02 SCALE: N.T.S.



NOTES:  
 • REFER TO INTERIOR ELEV. FOR ALIGNMENT INFORMATION

1 TYPES  
 1/10/02 SCALE: N.T.S.

## DOOR & FRAME NOTES:

- CONTRACTOR TO CONFIRM ALL FINISHES, LOCATIONS AND QUANTITIES AND NOTIFY CONSULTANT OF ANY DISCREPANCIES.
- ALL EXT. FLOORS TO HAVE HARDWARE IN CONFORMANCE WITH O.B.C. EXT. REQUIREMENTS. GC TO COORDINATE INSTALLATION AND LOCATIONS WITH DOOR AND HARDWARE MANUFACTURER.
- ALL EXTERIOR DOORS TO BE INSULATED AND HAVE THERMALLY BROKEN FRAMES. FILL FRAMES AND SPACE BETWEEN FRAMES AND ADJ. MATERIALS W/ SPRAY FOAM INSULATION TO FULLY SEAL AGAIN ALL AIR INFILTRATION.
- PROVIDE WEATHER STRIPPING ON ALL EXTERIOR DOORS.
- GC TO COORDINATE JAMB WIDTHS AND DETAILS WITH ON-SITE CONDITIONS. GC TO PRODUCE SHOP DRAWINGS OF JAMB DETAILS FOR ARCHITECTS REVIEW AND APPROVAL.
- PROVIDE MANU. FLOOR ANCHOR STRAPS FOR ALL HM JAMBS, FRAMES AND MULLIONS.
- ALL FIRE RATED DOORS REQUIRE DOOR CLOSERS.
- FOR DOOR SWINGS SEE PLAN.
- CONTRACTOR TO COORDINATE JAMB WIDTHS AND DETAILS WITH ON-SITE CONDITIONS. CONTRACTOR TO PRODUCE SHOP DRAWINGS OF JAMB DETAILS FOR ARCHITECTS REVIEW AND APPROVAL.
- IN FRAME DETAILS. CONTRACTOR TO REFERENCE ASSEMBLY TYPES FOR EXACT WIDTH AND COMPOSITION OF WALLS.
- PROVIDE MANUFACTURER'S FLOOR ANCHOR STRAPS FOR ALL HOLLOW METAL JAMB FRAMES AND MULLION FLOOR ANCHORS FOR HOLLOW METAL MULLIONS. ANCHORS TO BE FIRE RATED.
- ALL DOORS WITH KEYS TO BE KEYED TO A MASTER LOCK. ALL EXISTING ELECTRIC STRIKE-HOW TO BE REINSTALLED AS NOTED.
- COORDINATE THROAT SIZES TO WALL SCHEDULE AND MANUFACTURERS TOLERANCES.
- ALL GLASS DOORS SHALL BE CONSTRUCTED SO THAT THE EXISTENCE AND POSITION OF THE DOOR IS READILY APPARENT BY ATTACHING VISIBLE HARDWARE OR BY THE INSTALLATION OF VISION STRIPS.
- GC RESPONSIBLE FOR THE REMOVAL AND DEMOLITION OF ALL DOORS AND HARDWARE AS NOTED.

## LEGEND:

- |   |  |
|---|--|
| AL - ALUMINUM<br>CAPS - PROVIDE BOTTOM AND TOP DOOR CAPS<br>CA - CLEAR ANODIZED<br>CC - CONCEALED CLOSER<br>CL - CLOSER<br>CLF - CLASSROOM LOCK FUNCTION<br>CF - CLEAR FINISH<br>CH - CONT. HOOK<br>DC - DOOR CONTACT<br>EB - EXIT BUTTON<br>ED - CRASH BARRIERS/PANIC BAR EXIT DEVICE<br>FUP - FIRELITE PLUS GLASS<br>HM - HOLLOW METAL<br>HM1 - INSULATED HOLLOW METAL<br>HO - HOLD OPEN (MAGNETIC)<br>KO - KEY OVERRIDE<br>LTO - LAMINATED AND TEMPERED GLASS<br>M L - MAGLOCK | POD - POWER DOOR OPERATOR<br>PH - PANIC HARDWARE, PH W/<br>ALARM TO HAVE KEY OVERRIDE<br>PT - PAINT<br>PRV - PRIVACY LOCKSET<br>PP - PUSH/PULL<br>PUL - PUSH TO LOCK<br>PFIN - PAINT FINISH, REFER TO FINISH SCHEDULE<br>RTE - REQUIRED TO EXIT<br>SFL - STORE ROOM FUNCTION LOCK<br>TB - THERMALLY BROKEN<br>TG - TEMPERED GLASS<br>TH - THRESHOLD<br>TR - TEMPERATURE RISE<br>TT - THUMB TURN LOCK W/ INDICATOR<br>VC - VING CARD LOCK<br>WD - SOLID WOOD CORE<br>WD-V - WOOD VENEER FINISH<br>WS - WEATHERSTRIPPING |
|---|--|

2 NOTES  
 1/10/02 SCALE: N.T.S.

# RED

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**engineeringlink**  
 building envelope & structure

375 University Avenue, Suite 901,  
 Toronto, ON M5G 2J5  
 416-599-(LINK) 5465  
 www.engineeringlink.ca

Project No. 24-1333

NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2025/01/17
02	ISSUED FOR COORDINATION	2025/01/21
03	ISSUED FOR COORDINATION	2025/01/27
04	ISSUED FOR PERMIT	2025/02/07
05	ISSUED FOR CLIENT REVIEW	2025/02/27
06	ISSUED FOR COORDINATION	2025/03/05
07	ISSUED FOR PERMIT COMMENTS	2025/04/04
08	ISSUED FOR TENDER	2025/04/09



CONTRACTOR MUST CHECK + VERIFY ALL DIMENSIONS ON SITE.

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PROJECT INFORMATION KELS0 ARRIVAL CENTRE  
 5234 KELS0 ROAD  
 MILTON, ON L9E 0C6

DRAWING TITLE

TYPES & SCHEDULES

PROJECT NO.: 24-5162  
 DATE:  
 SCALE:

DRAWN BY: DS  
 REVIEWED BY: AS

# A0 02



FINISH SCHEDULE

FLOOR FINISHES

CODE	FINISH	MANUFACTURER	DESCRIPTION	TYPICAL LOCATION(S)
CONC-1	POLISHED CONCRETE	N/A	POLISH SMOOTH, FINISH WITH COMMERCIAL SYSTEM CONCRETE FLOOR CLEAR COAT	SEASONAL TICKET SALES 103
CONC-2	CONCRETE	N/A	BROOM FINISHED	UNHEATED VESTIBULE 101
MTL-1	FLOOR GRATE	BORDEN GRATINGS	TYPE B (19-P-4), PRESSURE LOCKED GRATING, GALVANIZED FINISH	UNHEATED VESTIBULE 101

WALL FINISHES

CODE	FINISH	MANUFACTURER	DESCRIPTION	TYPICAL LOCATION(S)
PT	GW6	AS NOTED	REFER TO PAINT FINISHES SCHEDULE	AS NOTED
CONC-2	LIMESTONE	ARRISCRAFT	ADAR GEORGIAN BLEND - SPLIT FACED STONE CLADDING TO MATCH EXISTING STONE BLEND, SEPJA	W-1, W-2, W-3
MTL-2	DEEP GREY	AGWAY METALS	PREFINISHED ALUMINUM PANEL, STRATUS PROFILE, HORIZONTAL INSTALLATION	W-4, W-5, W-6
ST-2	LIMESTONE TILE	MARBLE TREND	MOCA CREME, 12x24" LIMESTONE TILE, LEATHERED FINISH	AS NOTED

PAINT & STAIN FINISHES

CODE	FINISH	MANUFACTURER	DESCRIPTION	TYPICAL LOCATION(S)
PT-1	INTERIOR EGGSHELL PAINT	SHERWIN WILLIAMS	PEARLY WHITE, SW7009	TYP. WALLS THROUGHOUT U.O.N.
PT-2	INTERIOR SEMI-GLOSS	DULUX	OBSIDIAN	DOORS AND FRAMES THROUGHOUT U.O.N.
PT-3	EXTERIOR GLOSS	SHERWIN WILLIAMS	BLACK OF NIGHT, SW6993	EXTERIOR STEEL COLUMN
STN-1	SEMI-TRANSLUCENT MATTE	SIKENS PROLUXE CETOL SRD	CEDAR, #077	SOFFIT - TYP. U.N.O.
STN-2	SEMI-TRANSLUCENT MATTE	SIKENS INTERIOR WATER BASED STAIN	CEDAR, #077	WOOD CEILING - TYP. U.N.O.
STN-3	SEMI-TRANSLUCENT MATTE	SIKENS PROLUXE CETOL LOG & SIDING STAIN	CEDAR, #077	COLUMN CLADDING - TYP. U.N.O.

CEILING FINISHES

CODE	FINISH	MANUFACTURER	DESCRIPTION	TYPICAL LOCATION(S)
WD-1	STN-2	REFER TO SCHEDULE	4" T&G DOUGLAS FIR	UNCONDITIONED VESTIBULE 101, EXTERIOR SOFFIT
PT-4	INTERIOR FLAT PAINT	SHERWIN WILLIAMS	PEARLY WHITE, SW7009	SEASONAL TICKET OFFICE 103

WALL BASE FINISHES

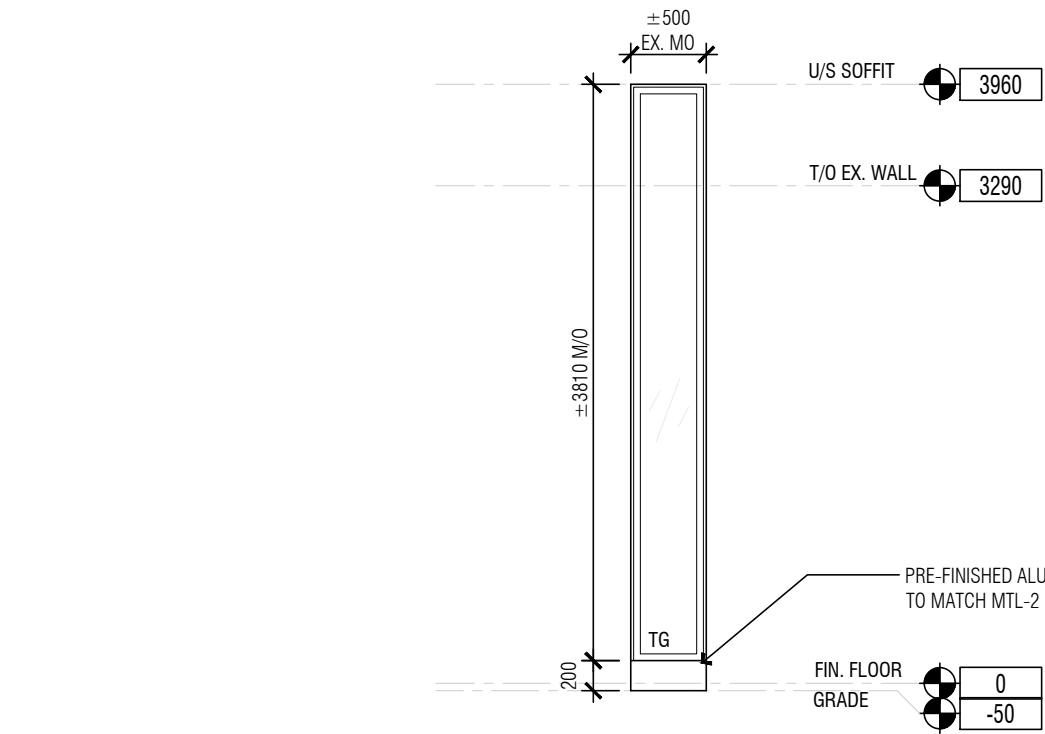
CODE	FINISH	MANUFACTURER	DESCRIPTION	TYPICAL LOCATION(S)
WB-1	BLACK	JOHN-SONITE	4" TOED VINYL BASE	SEASONAL TICKET OFFICE 103

ROOF FINISHES

CODE	FINISH	MANUFACTURER	DESCRIPTION	TYPICAL LOCATION(S)
MTL-3	DEEP GREY	AGWAY METALS	PREFINISHED ALUMINUM PANEL, OPTIMUM RIB PROFILE	ROOF U.N.O.

FINISH NOTES:

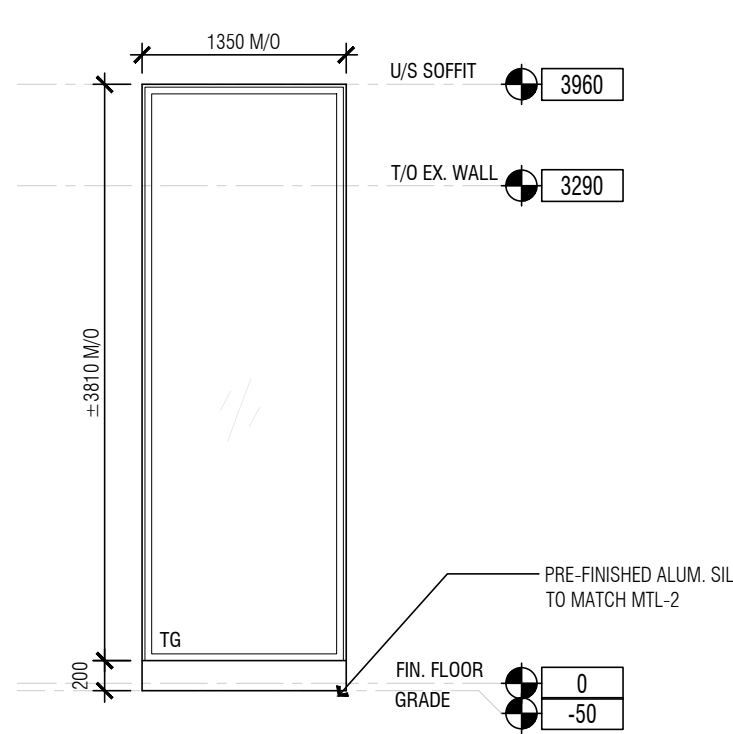
- ALL EXPOSED STEEL, DECKING, BEAMS, OPEN WEB STEEL, JOISTS, FRAMING, BRACING, SUPPORTS, DUCTWORK, HVAC EQUIPMENT, ELECTRICAL CONDUIT, JUNCTION BOXES, AND ANY OTHER VISIBLE ITEMS TO BE PAINTED PT-4 UNLESS OTHERWISE NOTED.
- PROVIDE PAINT FINISH ON ALL GW6 - GW6 TO BE PAINTED PT-1 UNLESS OTHERWISE NOTED.
- REFER TO INTERIOR ELEVATIONS AND FINISH DRAWINGS FOR COMPLETE EXTENT AND LOCATION OF FINISHES
- PROVIDE CLEAR SEAL ON ALL WOOD DOORS AND ANY WOOD FRAMES, SILLS, AND FINISH WOOD WORK
- ALL EXPOSED MECHANICAL GRILLES ARE TO BE PAINTED TO MATCH ADJACENT WALL/ CEILING, ALLOW FOR COLOURS TO BE DETERMINED BY ARCHITECT.
- PROVIDE THRESHOLDS AT ALL FLOOR TRANSITIONS.
- ALL INTERIOR AND EXTERIOR METAL BENCHES TO BE POWDER COATED TO MATCH PT-2.



- W-1 FIXED ALUMINUM WINDOW IN EXISTING MASONRY OPENING
- OPTIO AA 5450 FIXED WINDOWS, BY KAWNEER

- GLAZING
- 6MM TEMPERED DOUBLE GLAZED IGUs, ARGON FILLED W/ LOW-E COATING

- FINISHES
- EXTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW
  - INTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW



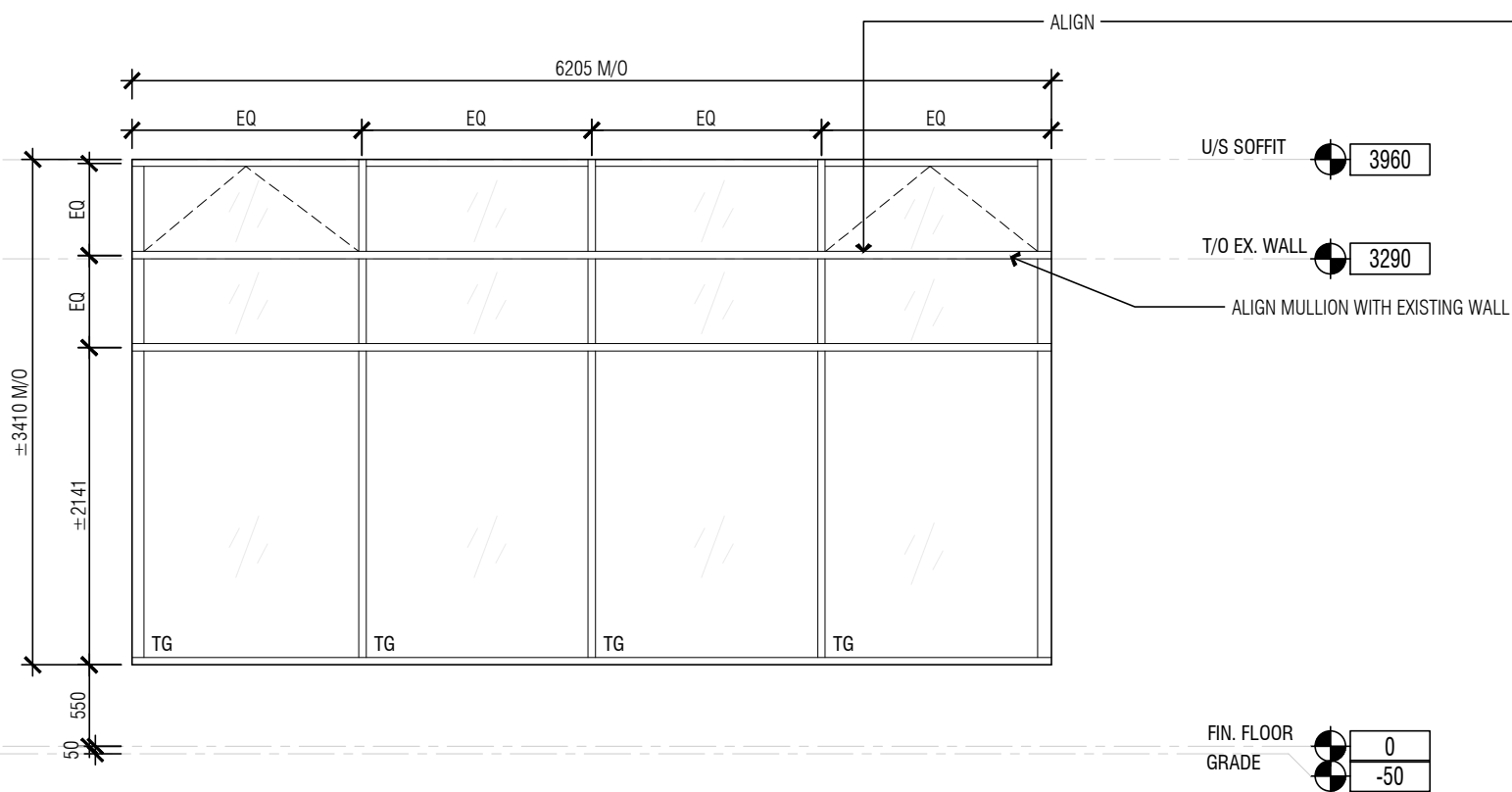
- W-2 FIXED ALUMINUM WINDOW IN EXISTING MASONRY OPENING
- OPTIO AA 5450 FIXED WINDOWS, BY KAWNEER

- GLAZING
- 6MM TEMPERED DOUBLE GLAZED IGUs, ARGON FILLED W/ LOW-E COATING

- FINISHES
- EXTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW
  - INTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW

WINDOW NOTES:

- ALL GLAZING DIMENSIONS ARE R.O., WF
- CONTRACTOR TO CONFIRM ALL FINISH, LOCATIONS AND NUMBERS AND NOTIFY CONSULTANT OF ANY DISCREPANCIES. CONTRACTOR TO COORDINATE WINDOW WIDTHS AND DETAILS WITH ON-SITE CONDITIONS.
- ALL EXTERIOR WINDOWS ARE TO BE INSULATED & HAVE THERMALLY BROKEN FRAMES. FILL FRAMES AND SPACE BETWEEN FRAMES AND ADJACENT MATERIALS W/ SPRAY FOAM INSULATION.
- CONTRACTOR TO SUBMIT SHOP DRAWINGS STAMPED BY A QUALIFIED ENGINEER CONFIRMING WINDOW MULLIONS + GLAZING IDENTIFIED ABOVE ARE DESIGNED FOR A MINIMUM HORIZONTAL LOAD OF 0.5 kN/m OR 1.0 kN APPLIED AT THE MINIMUM GUARD HEIGHT OF 1070mm AS PER CBC 9.8.8.2.
- ALL OPERABLE WINDOWS TO BE OPEN TO EXTERIOR UNLESS OTHERWISE NOTED.
- PROVIDE TAMPER PROOF SCREENS AT ALL OPERABLE WINDOWS U.O.N.
- ALL EXTERIOR GLAZING TO BE COORDINATED W/ EXISTING MASONRY OPENINGS. CONTRACTOR TO VERIFY DIMENSIONS ON SITE.

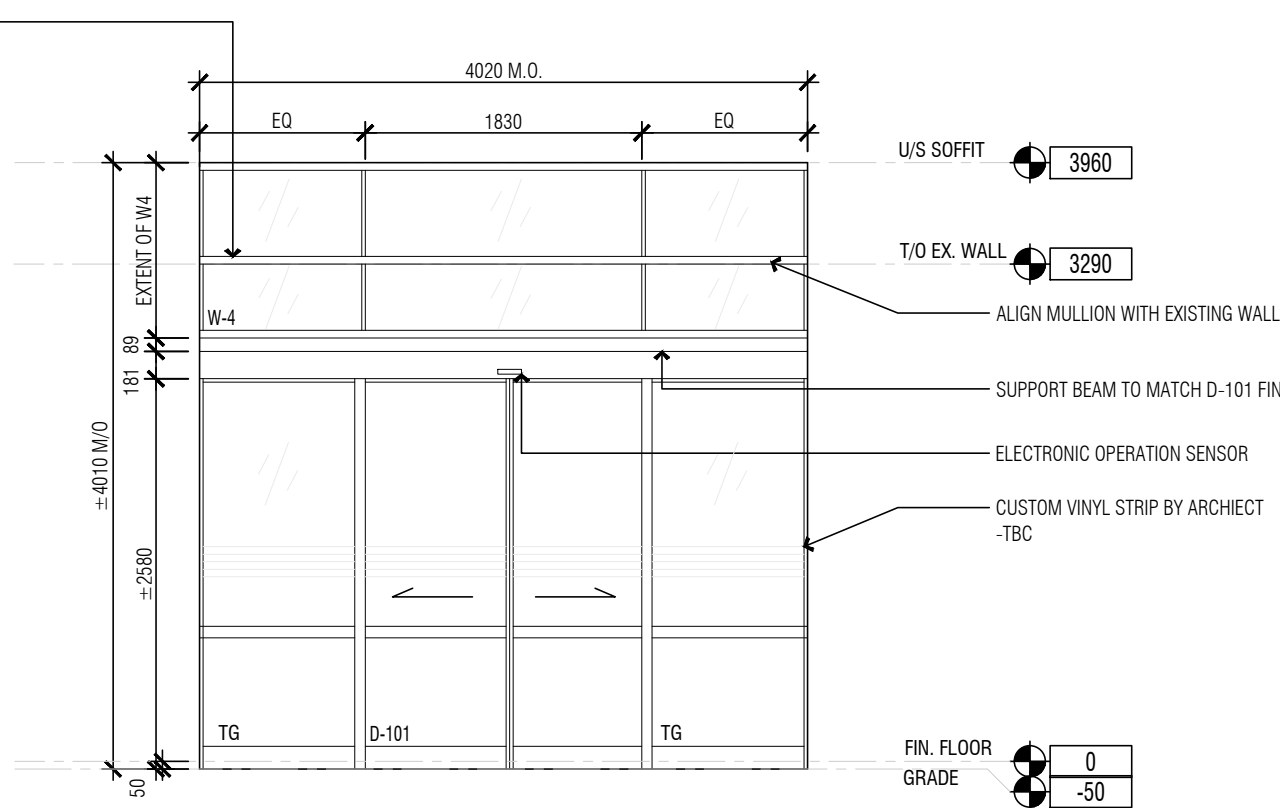


- W-3 ALUMINUM WINDOW
- TRIFAB 451 SYSTEM, BY KAWNEER
  - INCORPORATE OPERABLE GLASSVENT AWNINGS AS SHOWN

- GLAZING
- 6MM TEMPERED DOUBLE GLAZED IGUs, ARGON FILLED W/ LOW-E COATING

- FINISHES
- EXTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW
  - INTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW

- ACCESSORIES
- PROVIDE CAM LOCK WITH POLE RING AND SASH POLE
  - PROVIDE INSECT SCREENS AT ALL OPERABLE WINDOWS



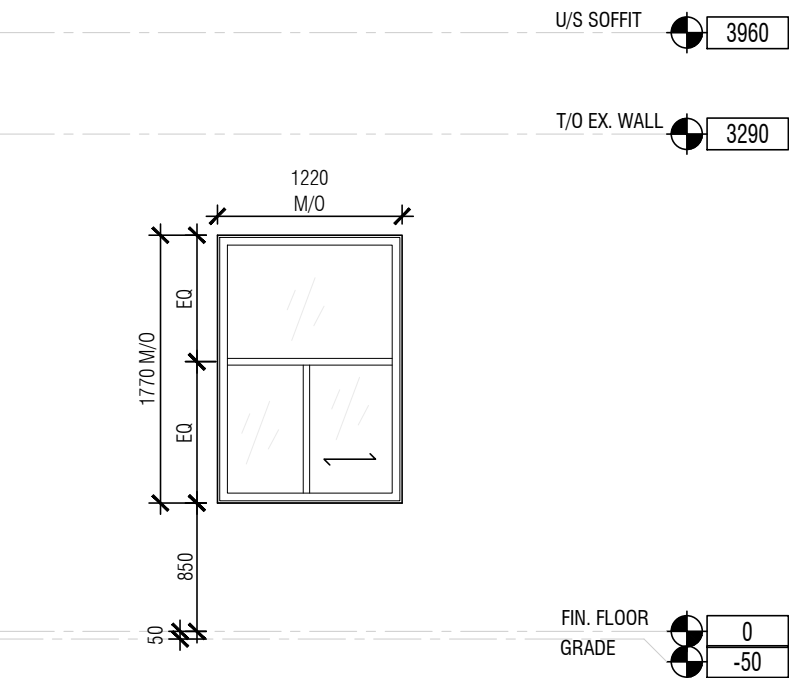
- D-101, W-4 AUTOMATIC SLIDING DOOR AND WINDOW WALL SYSTEM
- DOOR, ASSA ABL0Y SL500 SE SLUM ECO DOOR SYSTEM W/ SL300 SLIM DOOR
  - DOOR IS OVERHEAD CONCEALED FULL BREAKOUT BI-PART SLIDING DOOR SYSTEM PACKAGE - PROVIDE RECESSED FLUSH PANO HARDWARE
  - MEDIUM STYLE

- FINISHES
- INTERIOR AND EXTERIOR FINISH: CLEAR ANODIZED

- TRANSOM: TRIFAB 451 SYSTEM, BY KAWNEER

- GLAZING
- 6MM TEMPERED DOUBLE GLAZED IGUs, ARGON FILLED W/ LOW-E COATING

- FINISHES
- EXTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW
  - INTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW

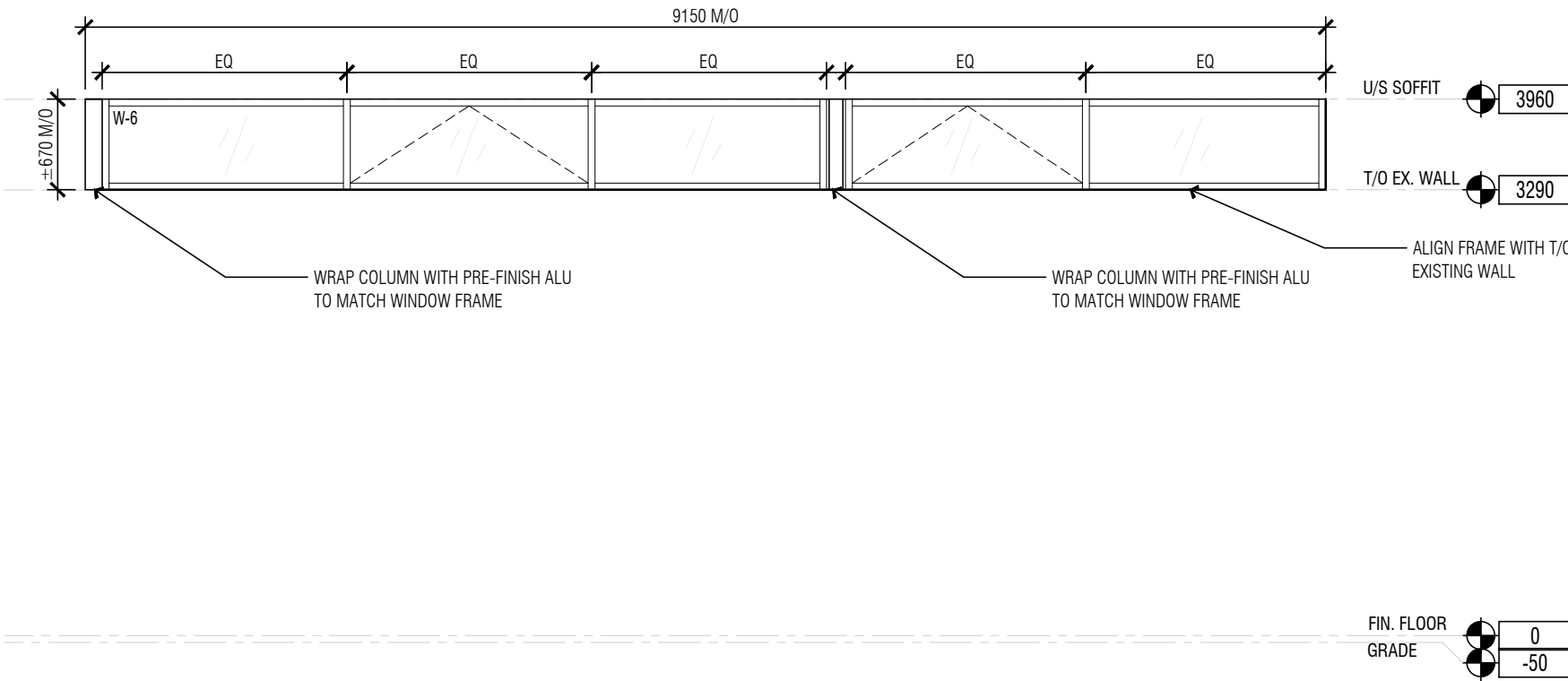


- W-5 HORIZONTAL SLIDING ALUMINUM WINDOW AT TICKET COUNTER
- OPTIO AA 5450 XIX SLIDING WINDOWS, BY KAWNEER

- GLAZING
- 6MM DOUBLE GLAZED IGUs, ARGON FILLED W/ LOW-E COATING

- FINISHES
- EXTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW
  - INTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW

- NO SCREENS TO BE PROVIDED AT SLIDING WINDOWS

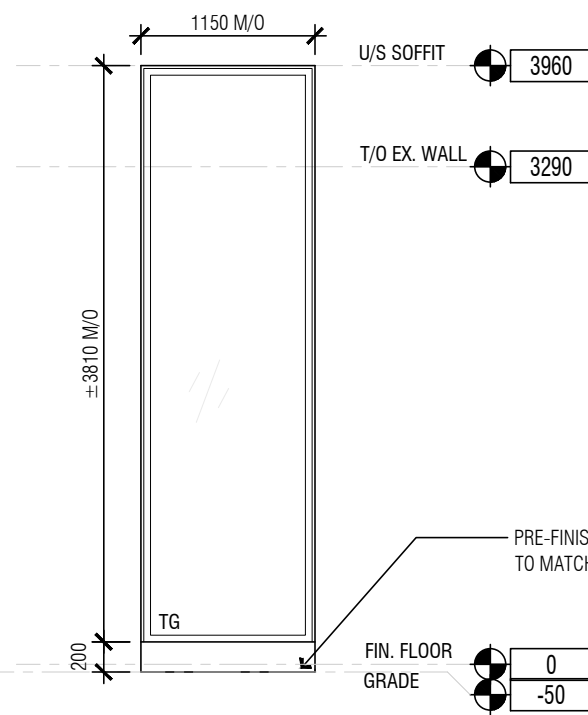


- W-6 ALUMINUM WINDOW
- OPTIO AA 5450 FIXED WINDOWS, BY KAWNEER
  - INCORPORATE OPERABLE AWNINGS AS SHOWN

- GLAZING
- 6MM DOUBLE GLAZED IGUs, ARGON FILLED W/ LOW-E COATING

- FINISHES
- EXTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW
  - INTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW

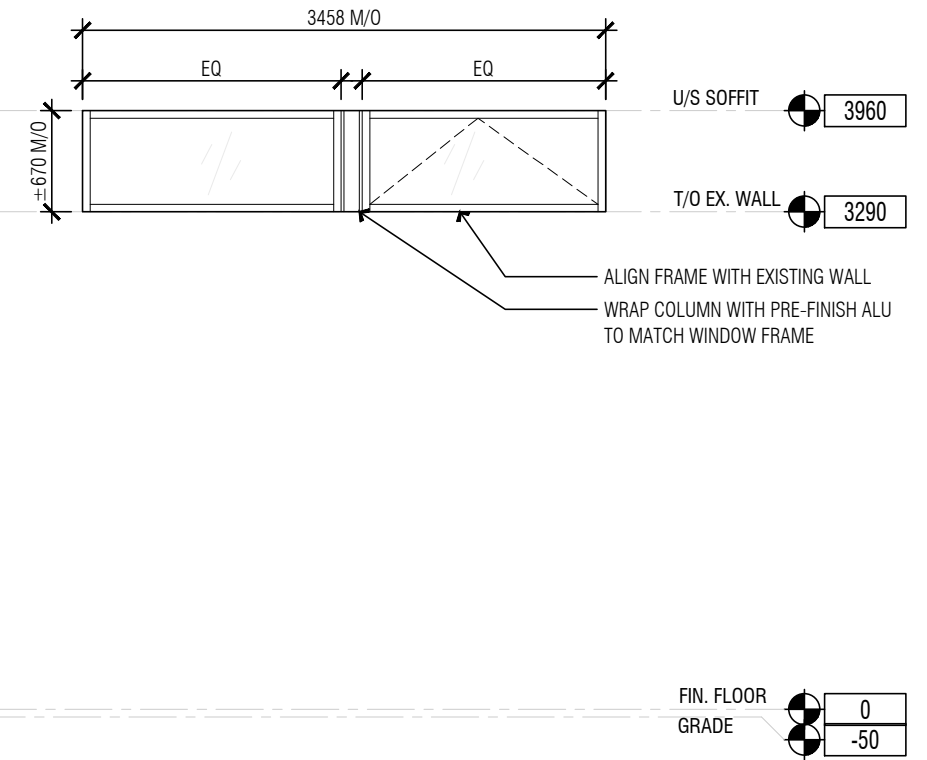
- ACCESSORIES
- PROVIDE CAM LOCK WITH POLE RING AND SASH POLE
  - PROVIDE INSECT SCREENS AT ALL OPERABLE WINDOWS



- W-7 FIXED ALUMINUM WINDOW
- OPTIO AA 5450 FIXED WINDOWS, BY KAWNEER

- GLAZING
- 6MM TEMPERED DOUBLE GLAZED IGUs, ARGON FILLED W/ LOW-E COATING

- FINISHES
- EXTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW
  - INTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW



- W-8 ALUMINUM WINDOW
- OPTIO AA 5450 FIXED WINDOWS, BY KAWNEER
  - INCORPORATE OPERABLE AWNINGS AS SHOWN

- GLAZING
- 6MM DOUBLE GLAZED IGUs, ARGON FILLED W/ LOW-E COATING

- FINISHES
- EXTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW
  - INTERIOR FINISH: CLEAR ANODIZED. PROVIDE SAMPLES FOR ARCHITECT REVIEW

- ACCESSORIES
- PROVIDE CAM LOCK WITH POLE RING AND SASH POLE
  - PROVIDE INSECT SCREENS AT ALL OPERABLE WINDOWS

NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2025/01/17
02	ISSUED FOR COORDINATION	2025/01/21
03	ISSUED FOR COORDINATION	2025/01/27
04	ISSUED FOR CLIENT REVIEW	2025/02/27
05	ISSUED FOR COORDINATION	2025/03/05
06	ISSUED FOR TENDER	2025/04/09

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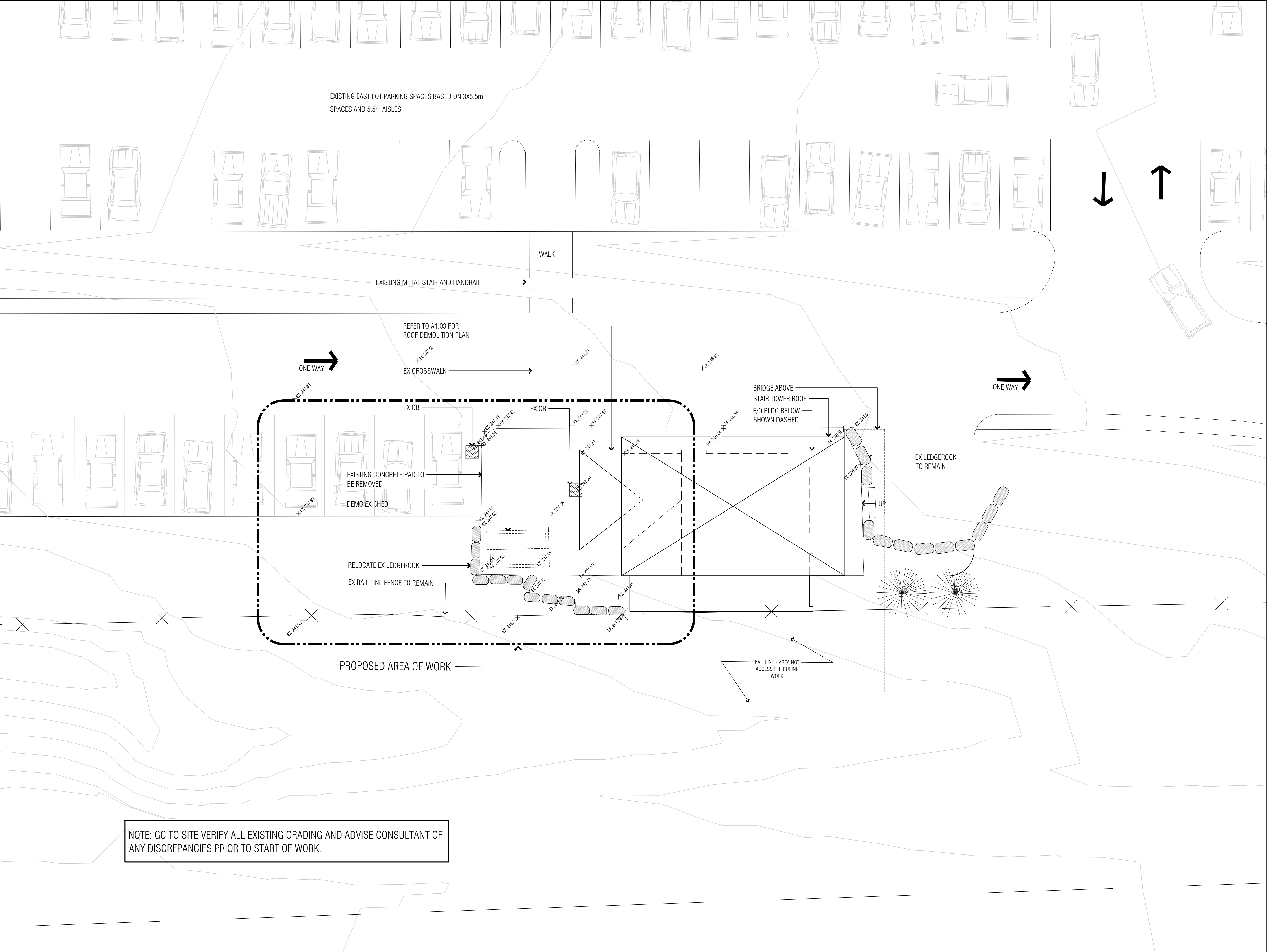
DRAWING TITLE

FINISH & WINDOW SCHEDULES

PROJECT NO.: 24-5162  
DATE:  
SCALE:

DRAWN BY: DS  
REVIEWED BY: AS





NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2024/07/17
02	ISSUED FOR CLIENT REVIEW	2024/11/20
03	ISSUED FOR COORDINATION	2024/11/26
04	ISSUED FOR PERMIT	2025/02/07
05	ISSUED FOR TENDER	2025/04/04



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PROJECT INFORMATION  
PROJECT  
NORTH  
TRUE NORTH

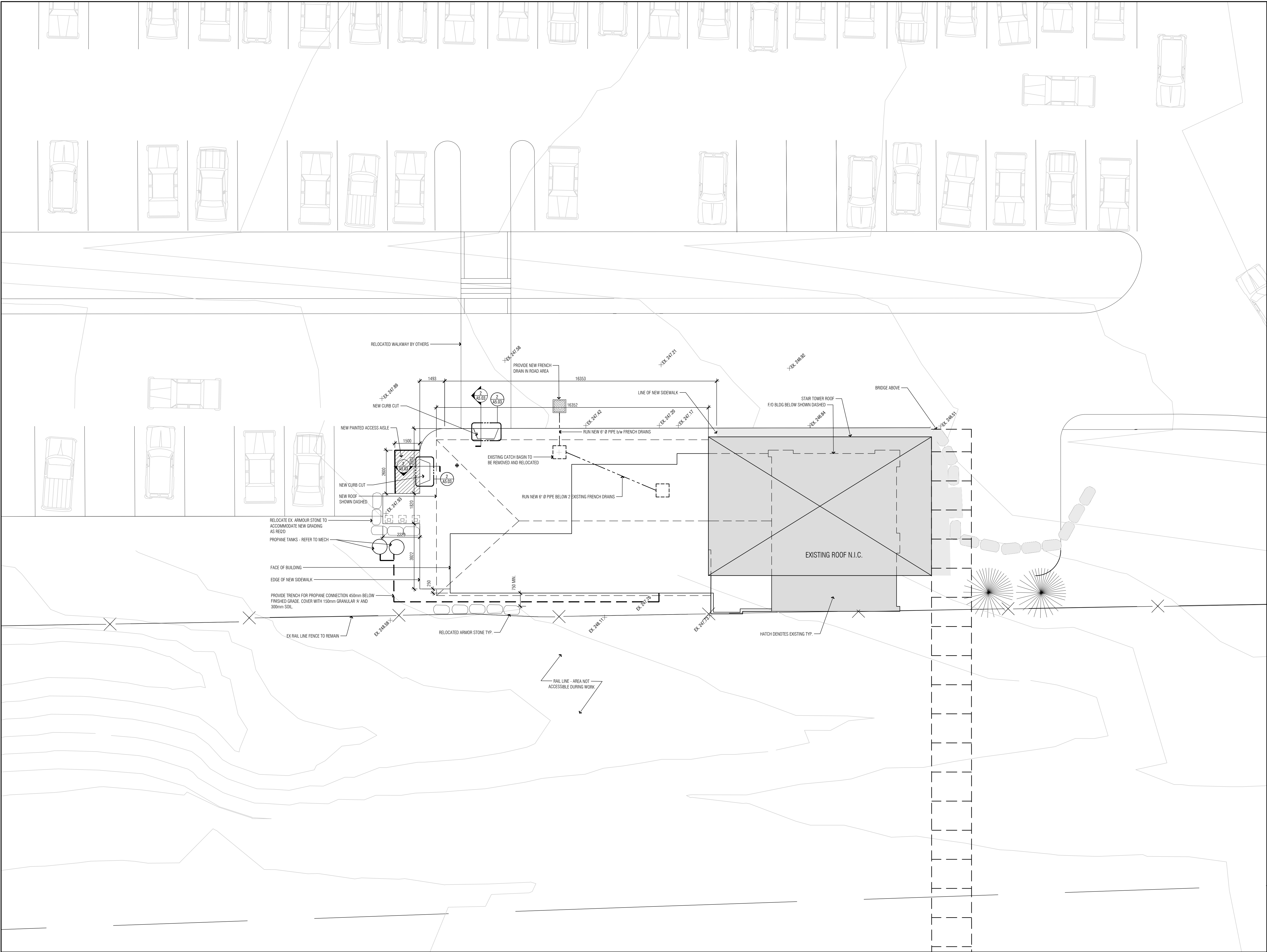
KELSO ARRIVAL CENTRE  
5234 KELSO ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
PARTIAL EXISTING SITE PLAN

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:100

DRAWN BY: DS  
REVIEWED BY: AS





RED

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building envelope & structure

375 University Avenue, Suite 901,  
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Project No. 24-1333

NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2024/07/17
02	ISSUED FOR CLIENT REVIEW	2024/11/20
03	ISSUED FOR PERMIT	2025/02/07
04	ISSUED FOR CLIENT REVIEW	2025/02/27
05	ISSUED FOR TENDER	2025/04/09



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PROJECT INFORMATION  
PROJECT  
NORTH  
TRUE NORTH

DRAWING TITLE  
PARTIAL PROPOSED SITE PLAN

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:100

DRAWN BY: DS  
REVIEWED BY: AS

A1

01

TENDER

NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2024/07/17
02	ISSUED FOR CLIENT REVIEW	2024/11/20
03	ISSUED FOR COORDINATION	2024/11/26
04	ISSUED FOR PERMIT	2025/02/07
05	ISSUED FOR TENDER	2025/04/09



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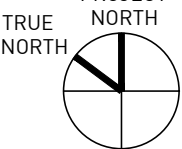
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PROJECT INFORMATION  
PROJECT: KELS0 ARRIVAL CENTRE  
5234 KELS0 ROAD  
MILTON, ON L9E 0C6



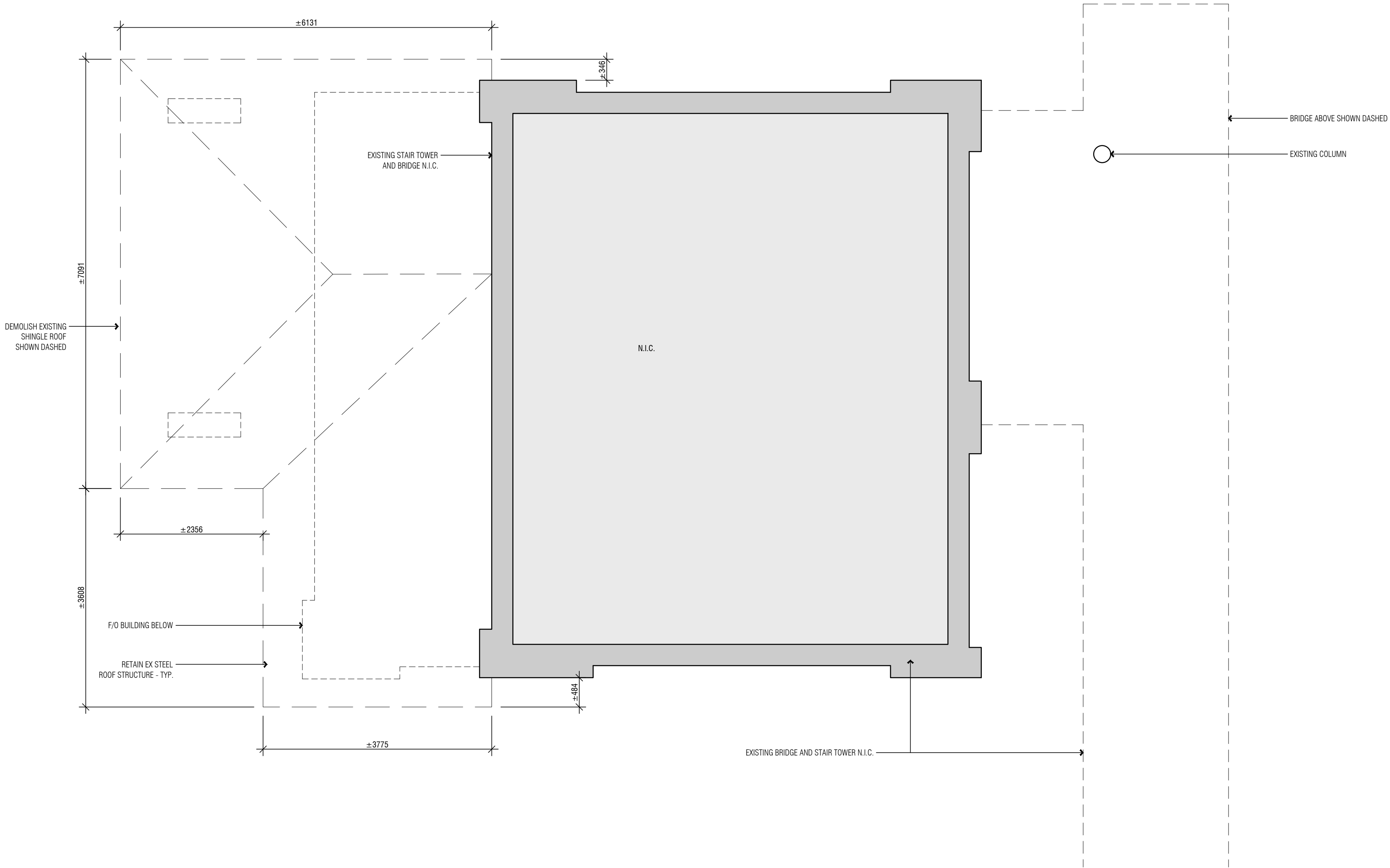
DRAWING TITLE  
DEMOLITION FLOOR PLAN

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

DRAWN BY: DS  
REVIEWED BY: AS



NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2024/07/17
02	ISSUED FOR CLIENT REVIEW	2024/11/20
03	ISSUED FOR COORDINATION	2024/11/24
04	ISSUED FOR PERMIT	2025/02/07
05	ISSUED FOR TENDER	2025/04/09



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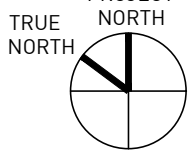
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PROJECT INFORMATION  
PROJECT: KELS0 ARRIVAL CENTRE  
NORTH: 5234 KELS0 ROAD  
MILTON, ON L9E 0C6



DRAWING TITLE  
DEMOLITION ROOF PLAN

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

DRAWN BY: DS  
REVIEWED BY: AS

NO.	DESCRIPTION	DATE
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04	ISSUED FOR COORDINATION	2025/01/17
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06	ISSUED FOR CLIENT REVIEW	2025/01/27
07	ISSUED FOR COORDINATION	2025/01/27
08	ISSUED FOR PERMIT	2025/02/07
09	ISSUED FOR CLIENT REVIEW	2025/02/27
10	ISSUED FOR COORDINATION	2025/03/19
11	ISSUED FOR TENDER	2025/04/09



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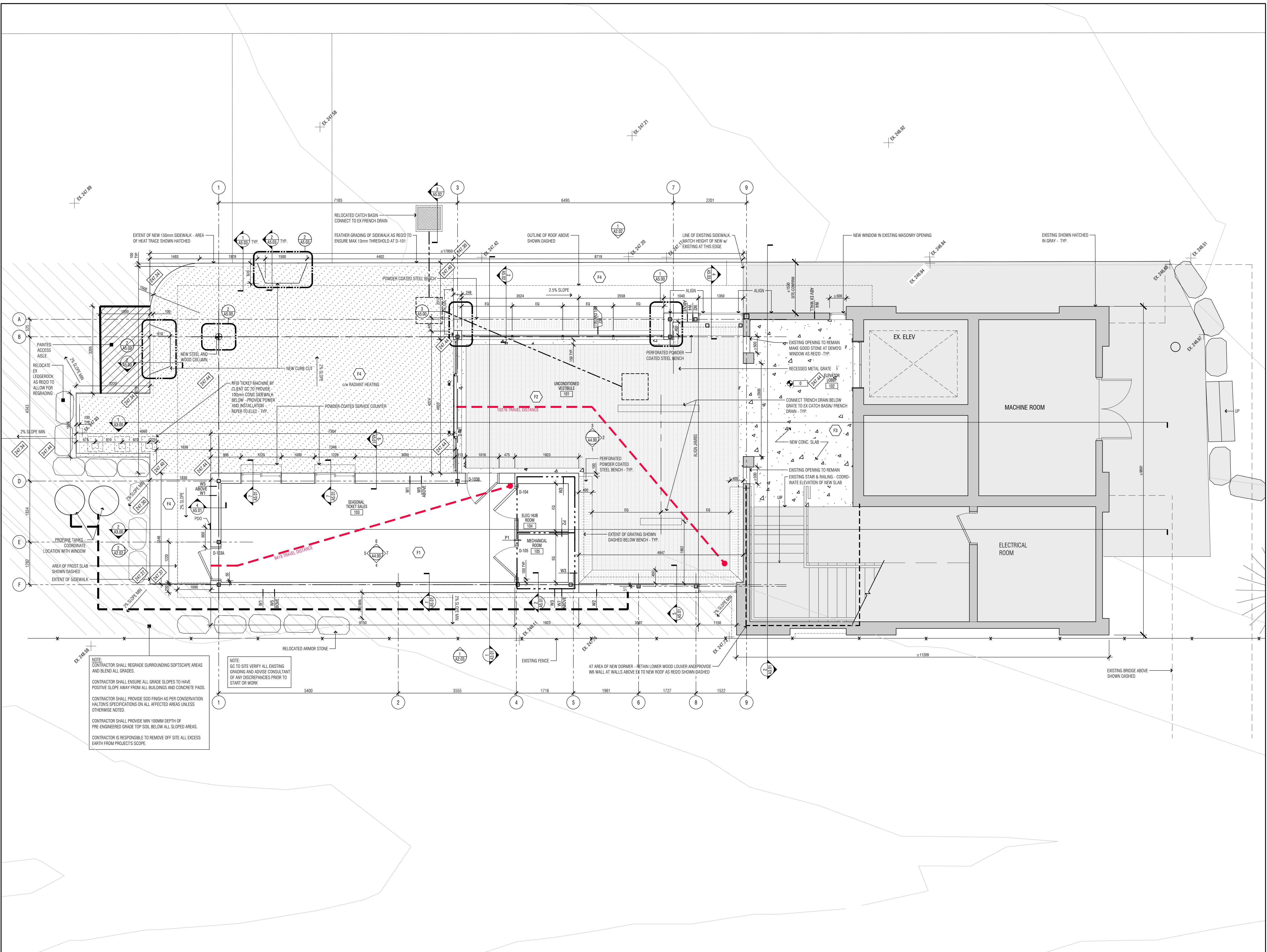


PROJECT INFORMATION  
PROJECT: KELS0 ARRIVAL CENTRE  
NORTH: 5234 KELS0 ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
PROPOSED FLOOR PLAN

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

DRAWN BY: DS  
REVIEWED BY: AS





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Project No. 24-1333

NO.	DESCRIPTION	DATE
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07	ISSUED FOR CLIENT REVIEW	2025/02/27
08	ISSUED FOR TENDER	2025/04/09



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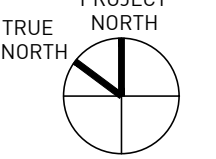
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<b>PROJECT INFORMATION</b>	KELSO ARRIVAL CENTRE
PROJECT	5234 KELSO ROAD
NORTH	MILTON, ON L9E 0C6



DRAWING TITLE  
PROPOSED RCP

PROJECT NO.: 24-5162  
DATE: 2024/10/12  
SCALE: 1:50

**DRAWN BY:** DS  
**REVIEWED BY:** AS

NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2024/07/17
02	ISSUED FOR CLIENT REVIEW	2024/11/20
03	ISSUED FOR COORDINATION	2024/11/26
04	ISSUED FOR PERMIT	2025/02/07
05	ISSUED FOR CLIENT REVIEW	2025/02/27



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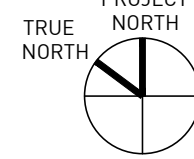
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PROJECT INFORMATION  
PROJECT NORTH  
KELSO ARRIVAL CENTRE  
5234 KELSO ROAD  
MILTON, ON L9E 0C6



DRAWING TITLE  
PROPOSED ROOF PLAN

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

DRAWN BY: DS  
REVIEWED BY: AS

NO.	DESCRIPTION	DATE
01	ISSUED FOR TENDER	2025/04/09

1 NORTH ELEVATION  
A2.00 1:50



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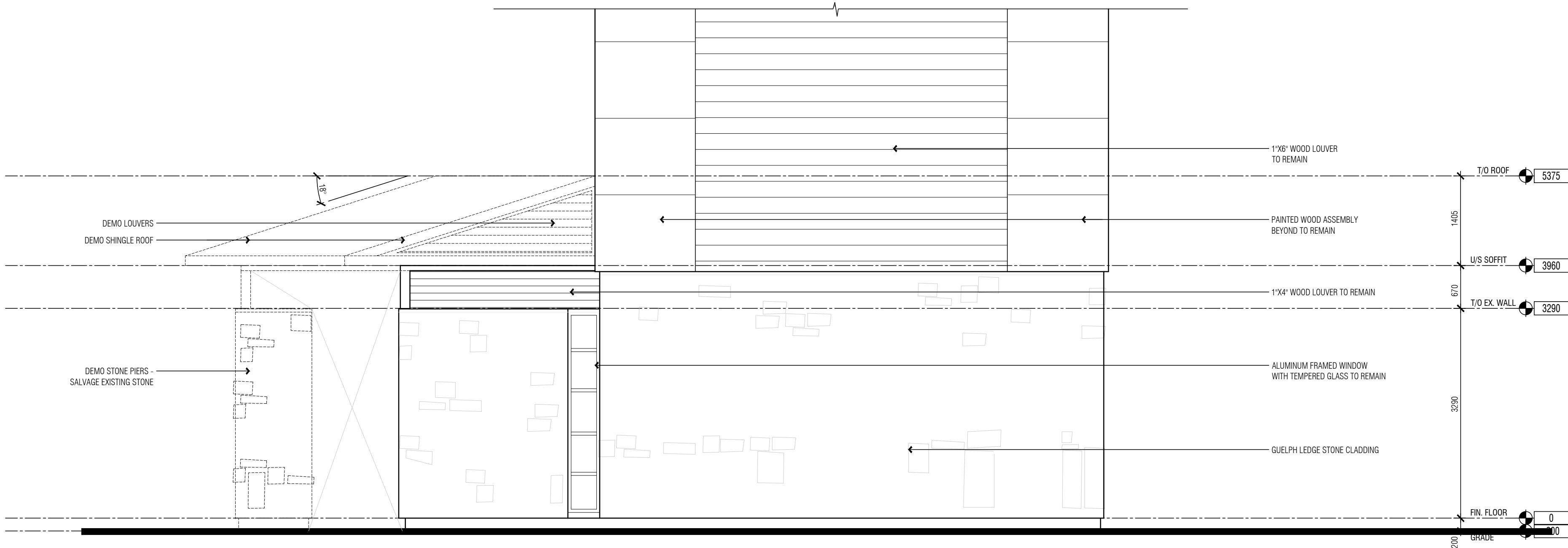


PROJECT INFORMATION KELS0 ARRIVAL CENTRE  
5234 KELS0 ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
DEMOLITION ELEVATIONS

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50  
DRAWN BY: DS  
REVIEWED BY: AS





1 SOUTH ELEVATION  
A2.01 1:50

RED

RED STUDIO INC. ARCHITECTS  
354 DAVENPORT ROAD, SUITE 300  
TORONTO, ONTARIO, M5R 1K6  
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Toronto, ON M5G 2J5  
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Project No. 24-1333

NO.	DESCRIPTION	DATE
01	ISSUED FOR TENDER	2025/04/09



TENDER

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PROJECT INFORMATION KELSEY ARRIVAL CENTRE  
5234 KELSEY ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
DEMOLITION ELEVATIONS

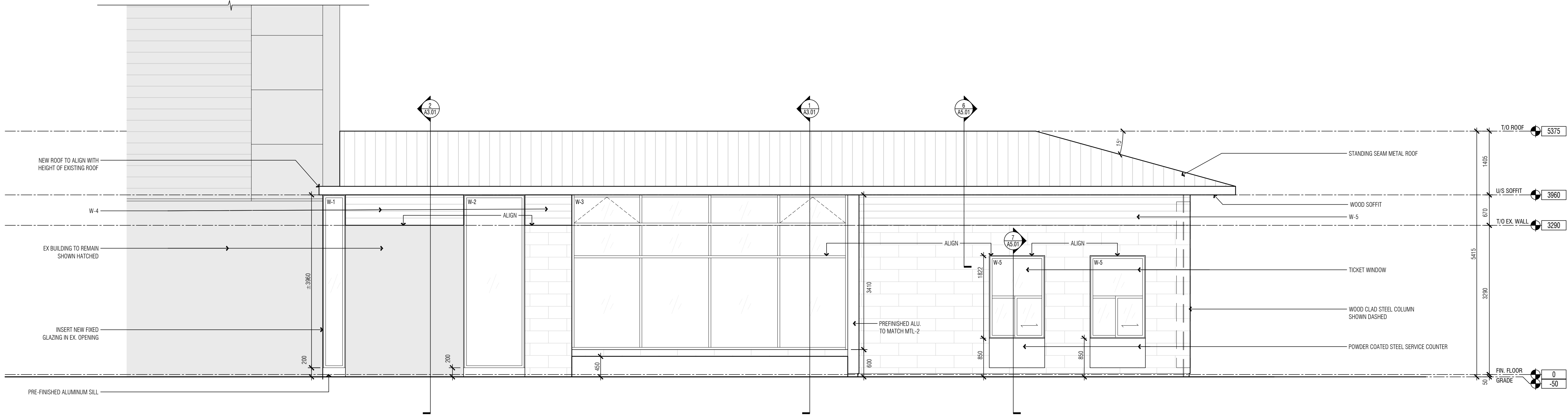
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DATE: 2024/07/17  
SCALE: 1:50

DRAWN BY: DS  
REVIEWED BY: AS

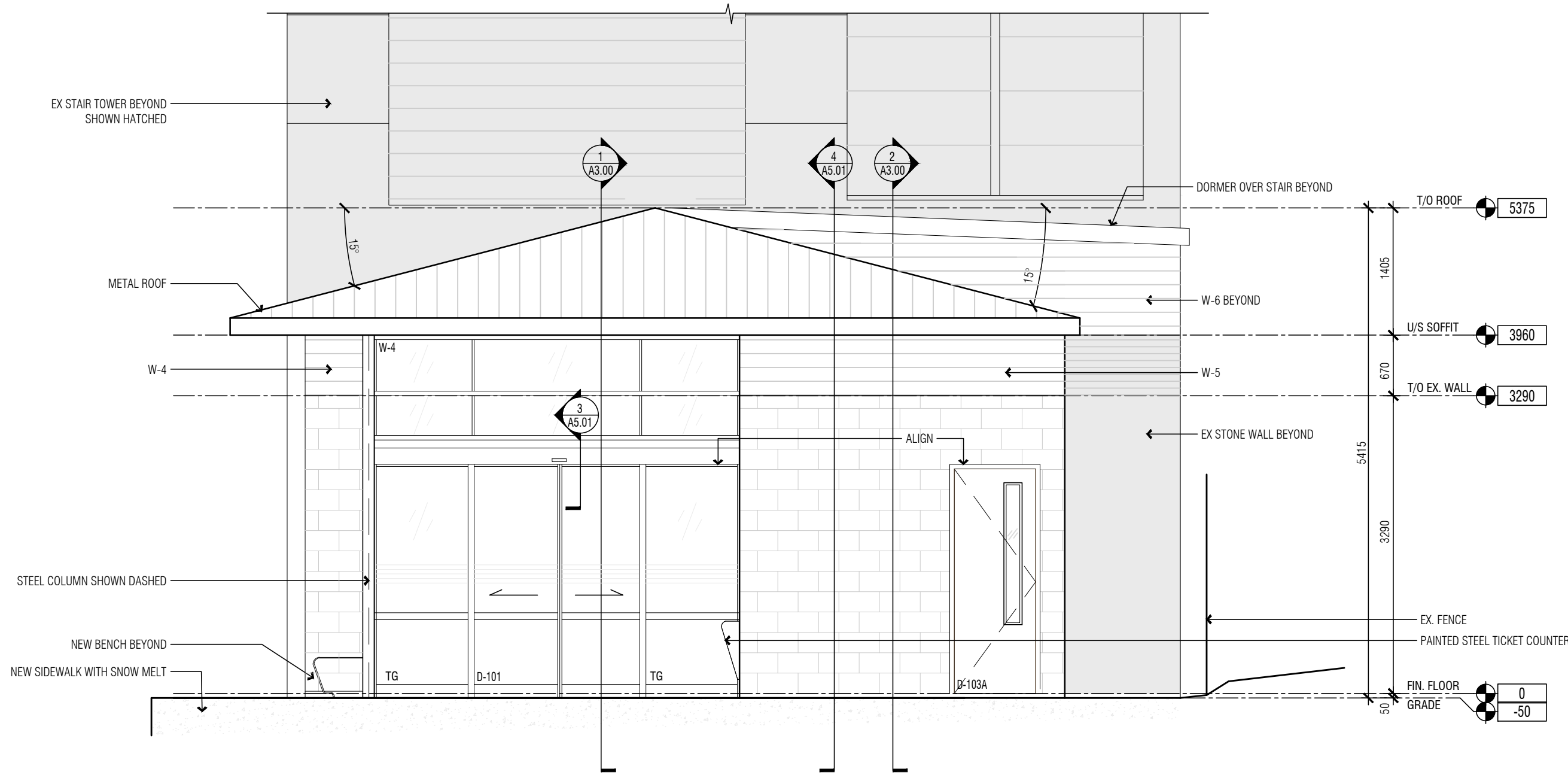
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NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2024/07/17
02	ISSUED FOR CLIENT REVIEW	2024/11/20
03	ISSUED FOR COORDINATION	2024/11/24
04	ISSUED FOR COORDINATION	2025/01/21
05	ISSUED FOR COORDINATION	2025/01/27
06	ISSUED FOR PERMIT	2025/02/07
07	ISSUED FOR CLIENT REVIEW	2025/02/27
08	ISSUED FOR COORDINATION	2025/03/19
09	ISSUED FOR TENDER	2025/04/09



1 NORTH ELEVATION  
A2.02 1:50



2 WEST ELEVATION  
A2.02 1:50



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PROJECT INFORMATION KELS0 ARRIVAL CENTRE  
5234 KELS0 ROAD  
MILTON, ON L9E 0C6

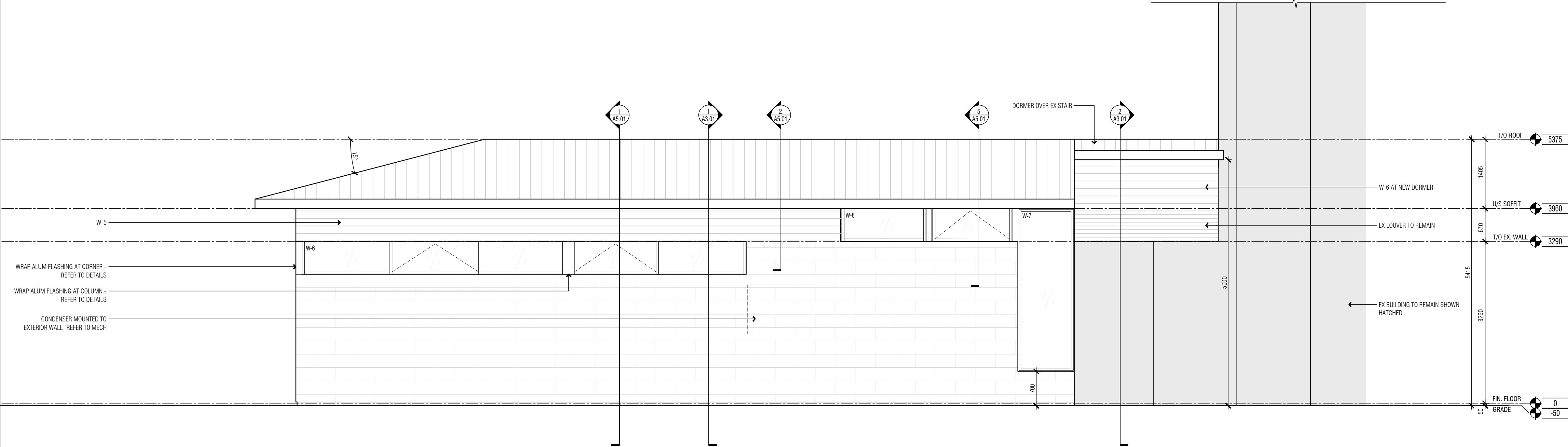
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PROPOSED ELEVATIONS

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

DRAWN BY: DS  
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NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2024/07/17
02	ISSUED FOR CLIENT REVIEW	2024/11/20
03	ISSUED FOR COORDINATION	2024/11/26
04	ISSUED FOR CLIENT REVIEW	2025/02/27
05	ISSUED FOR COORDINATION	2025/03/19
06	ISSUED FOR TENDER	2025/04/09

1 SOUTH ELEVATION  
A2.03 1:50



TENDER

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PROJECT INFORMATION KILSO ARRIVAL CENTRE  
5234 KILSO ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
PROPOSED ELEVATIONS

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

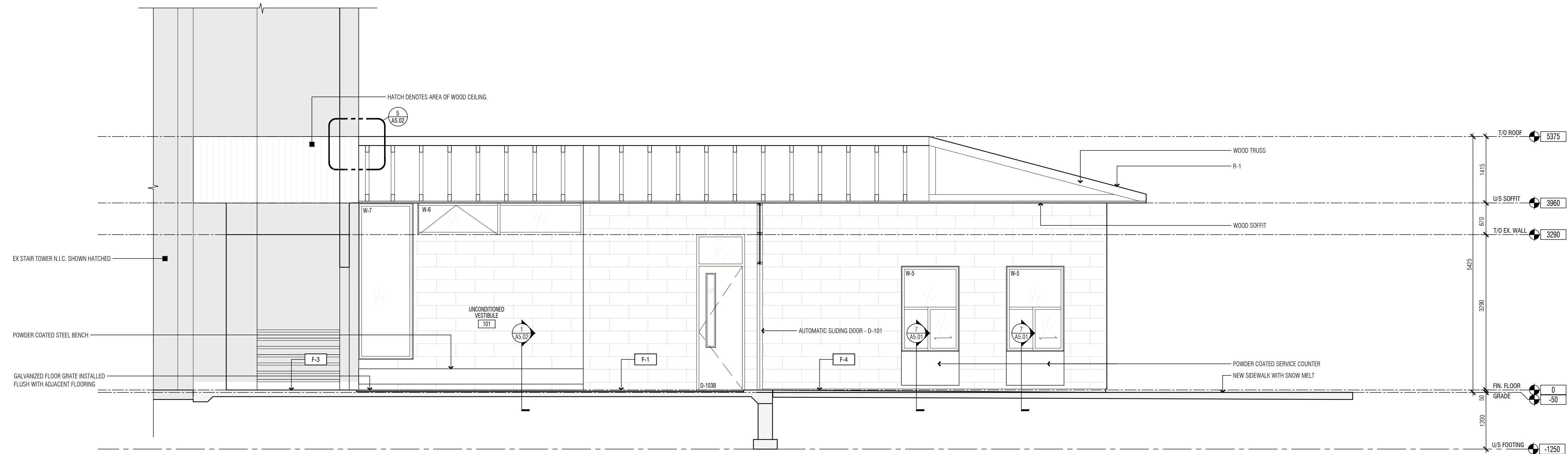
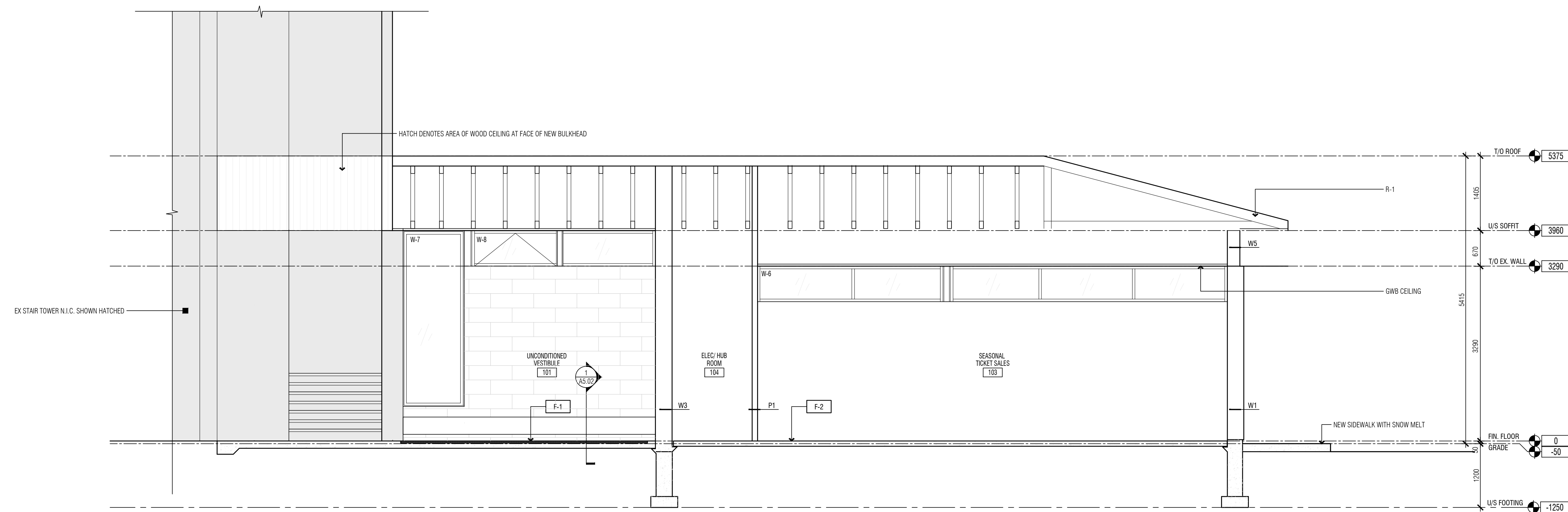
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Project No. 24-1333

NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2024/07/17
02	ISSUED FOR CLIENT REVIEW	2024/11/20
03	ISSUED FOR PERMIT	2025/02/07
04	ISSUED FOR CLIENT REVIEW	2025/02/27
05	ISSUED FOR TENDER	2025/04/09

1  
A3.00 BUILDING SECTION  
1:502  
A3.00 BUILDING SECTION  
1:50

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PROJECT INFORMATION KESLO ARRIVAL CENTRE  
5234 KESLO ROAD  
MILTON, ON L9E 0C6DRAWING TITLE  
PROPOSED BUILDING SECTIONSPROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50DRAWN BY: DS  
REVIEWED BY: AS



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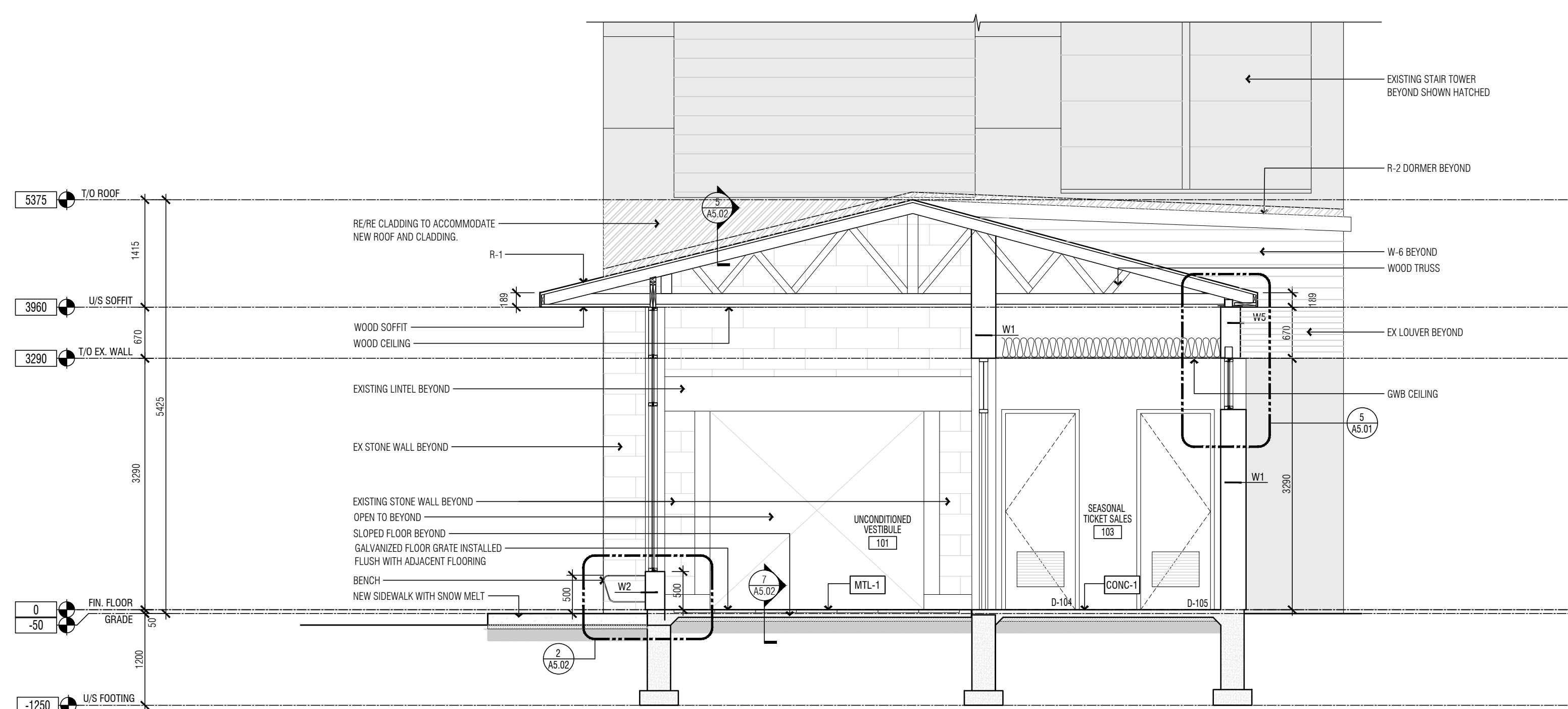
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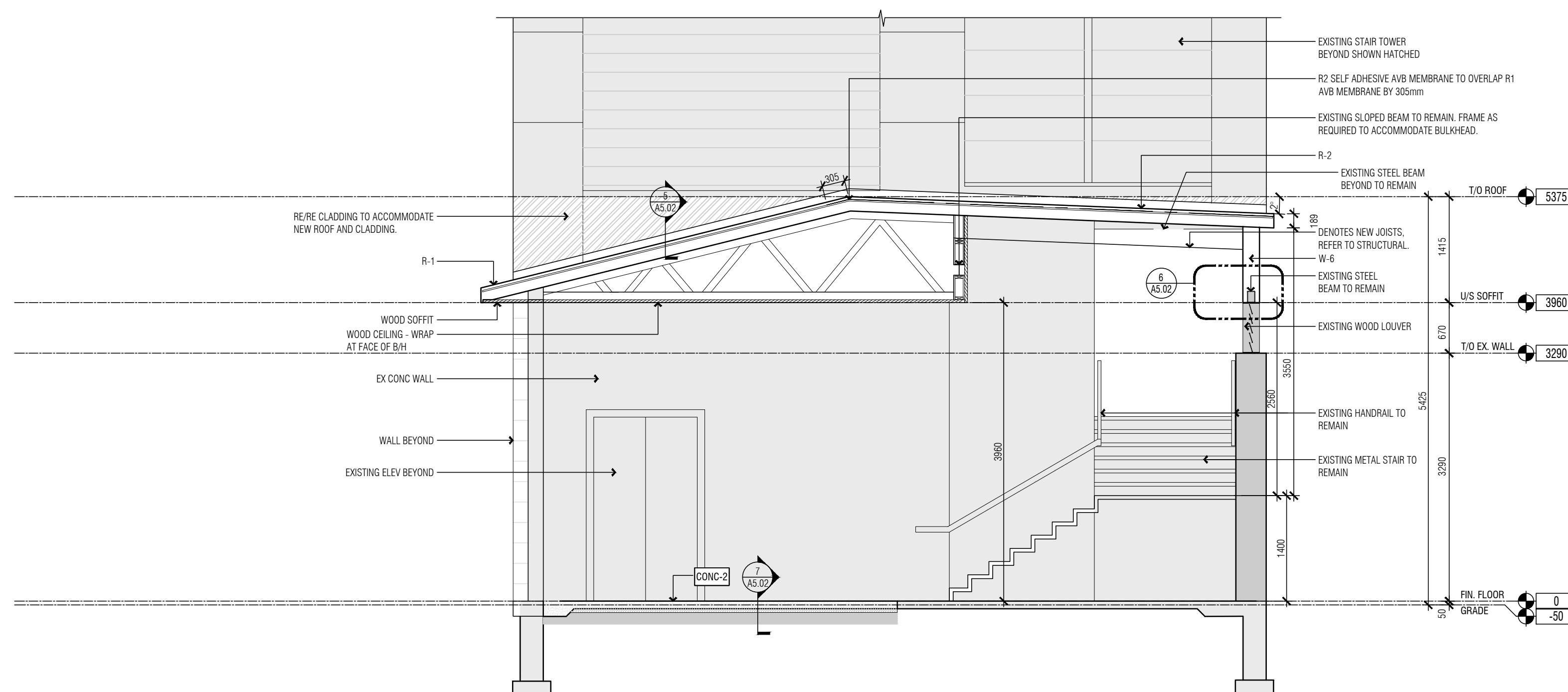
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NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2024/07/17
02	ISSUED FOR CLIENT REVIEW	2024/11/20
03	ISSUED FOR PERMIT	2025/02/07
04	ISSUED FOR CLIENT REVIEW	2025/02/27
05	ISSUED FOR COORDINATION	2025/03/26
06	ISSUED FOR TENDER	2025/04/09



1 BUILDING SECTION  
A3.01 1:50



2 BUILDING SECTION  
A3.01 1:50



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**PROJECT INFORMATION** KELSO ARRIVAL CENTRE  
5234 KELSO ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
PROPOSED BUILDING SECTIONS

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

**DRAWN BY:** DS  
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NO.	DESCRIPTION	DATE
01	ISSUED FOR TENDER	2025/04/09



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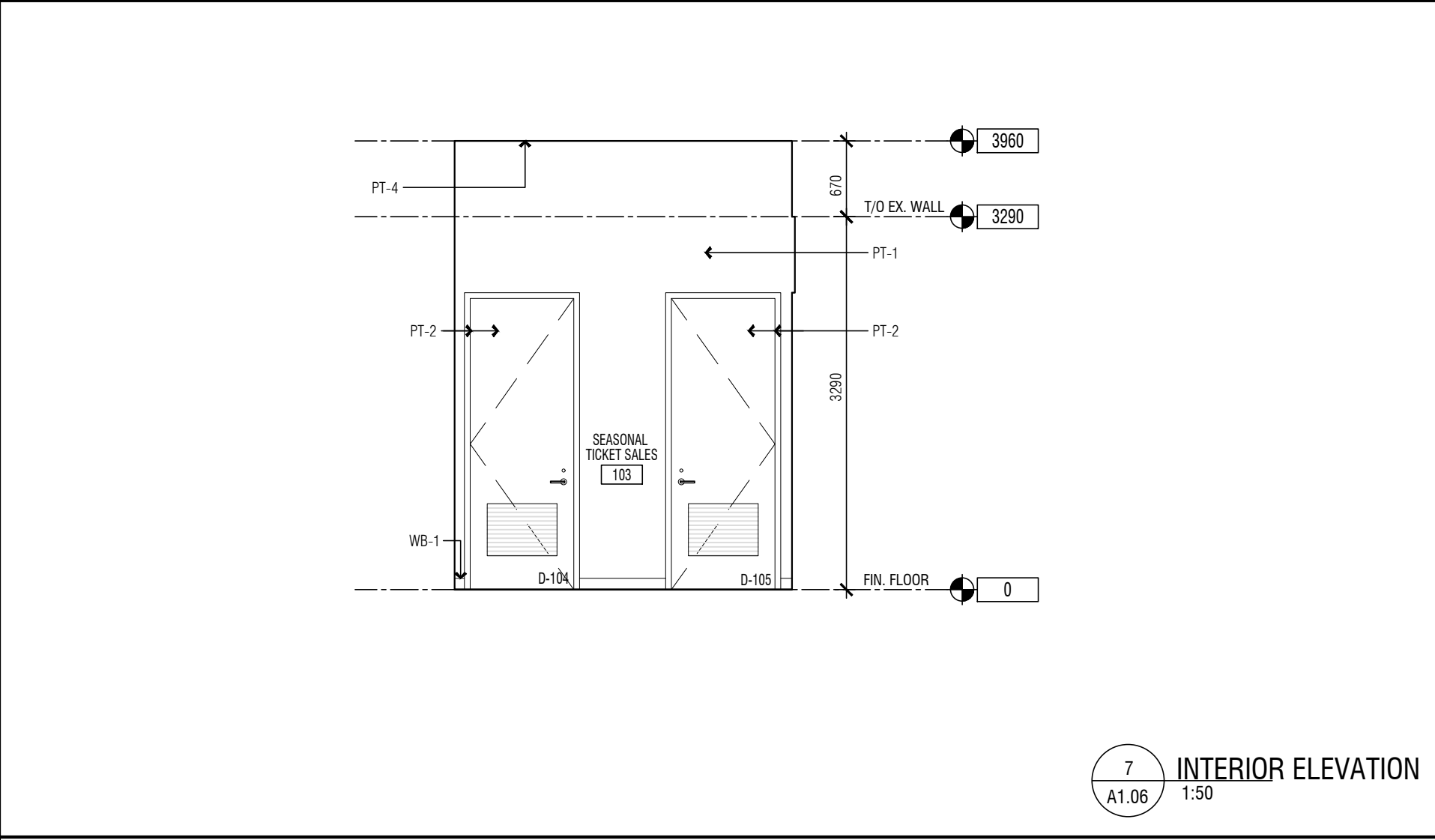
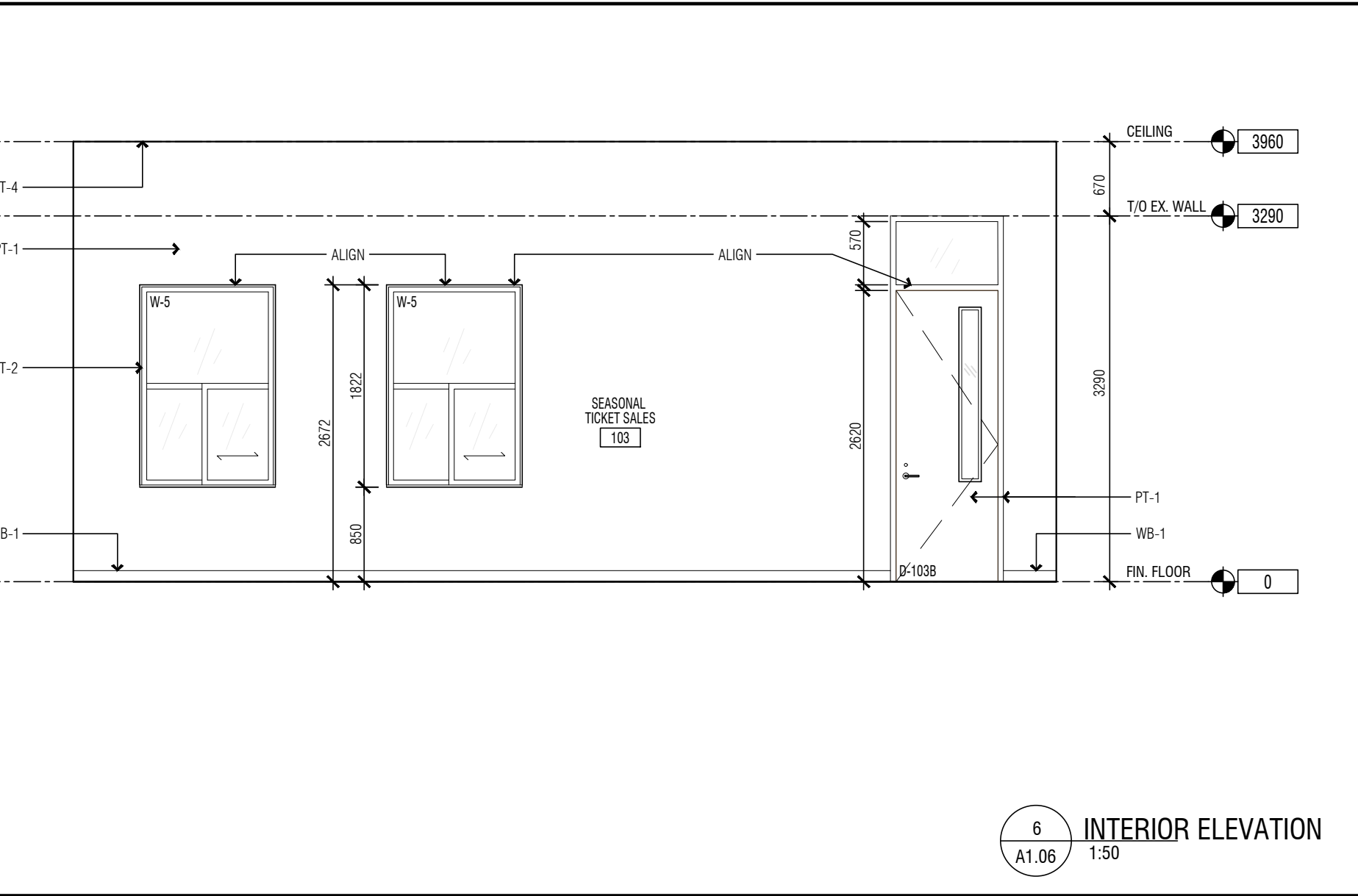
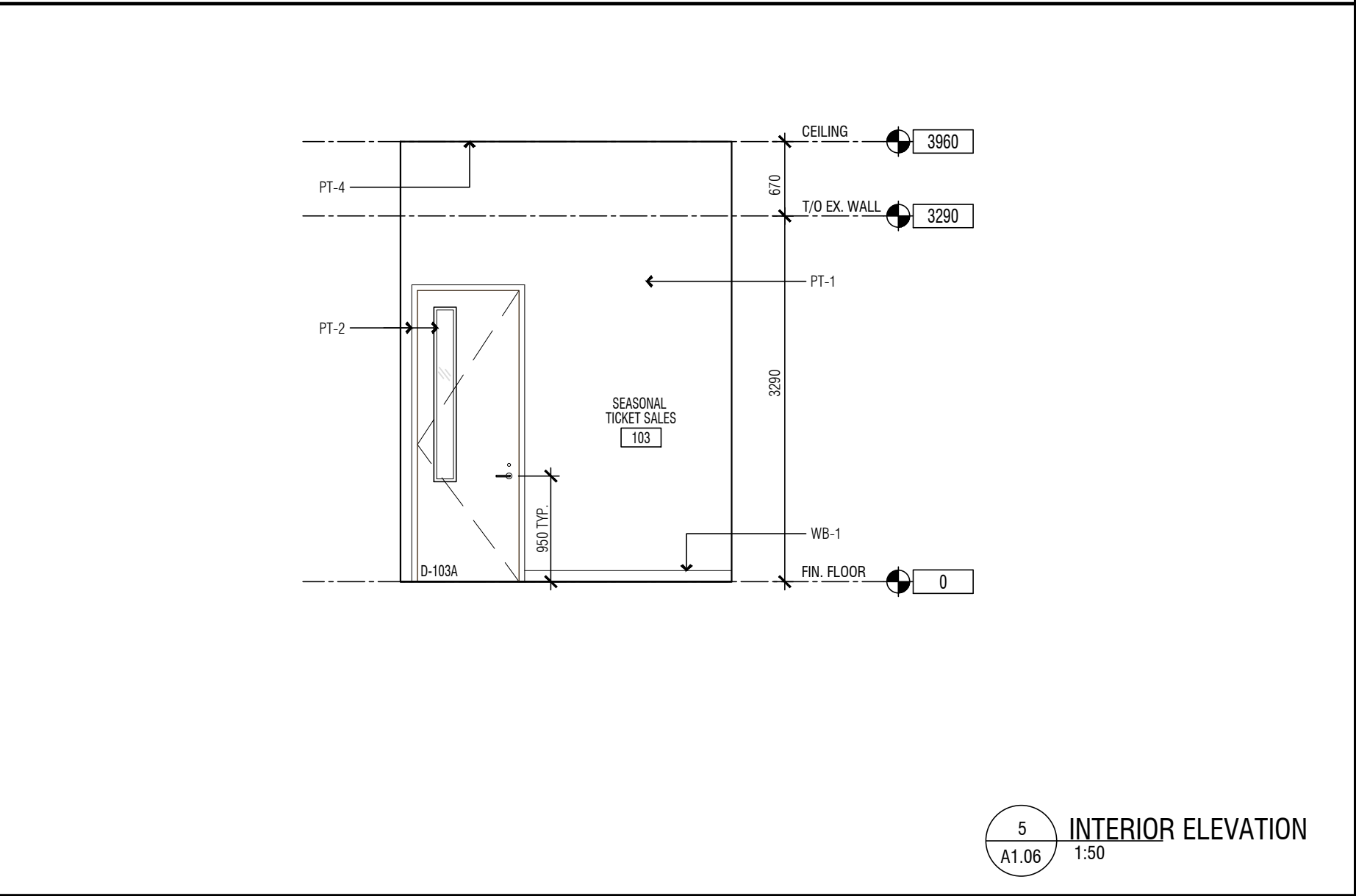
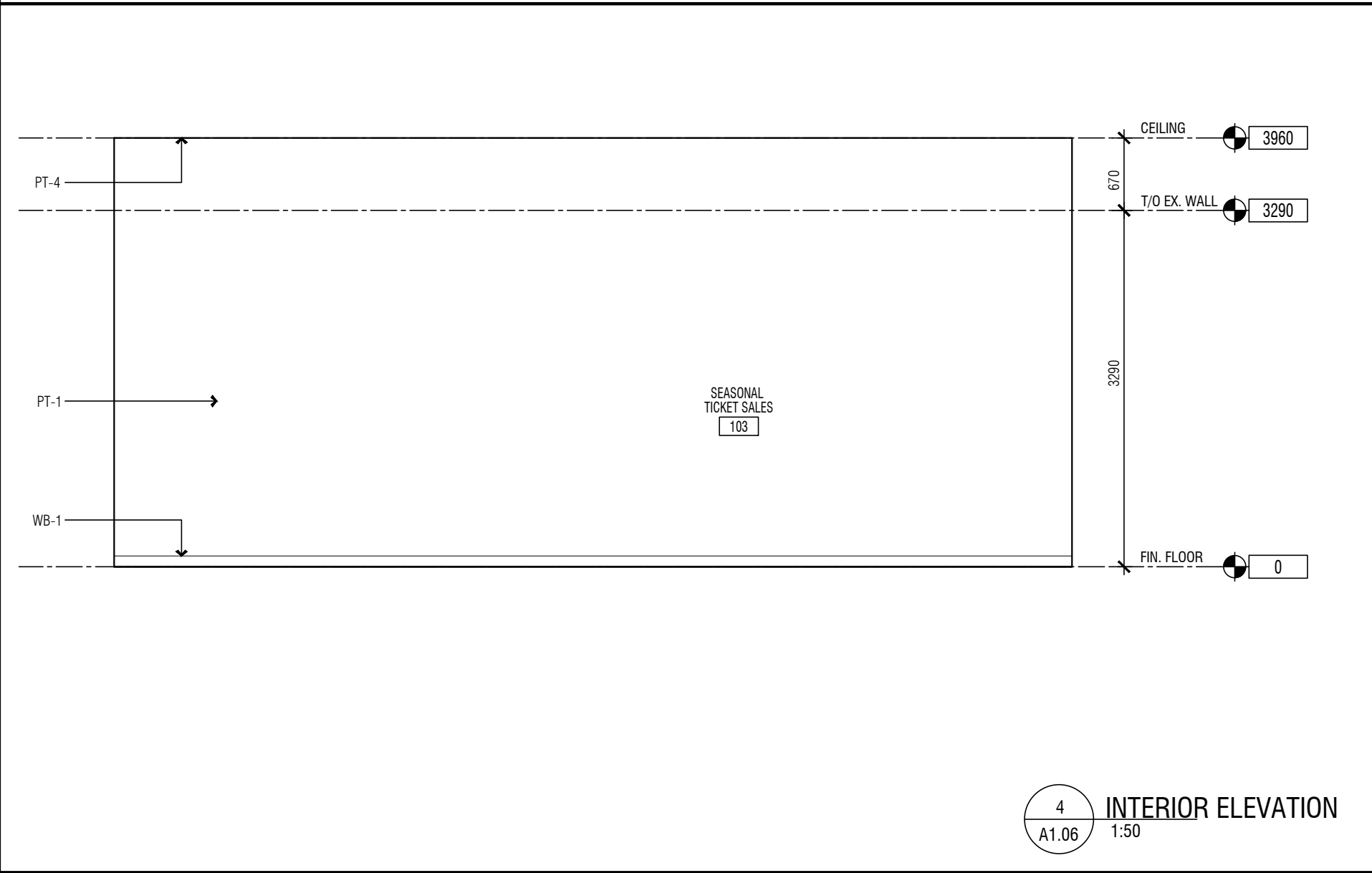
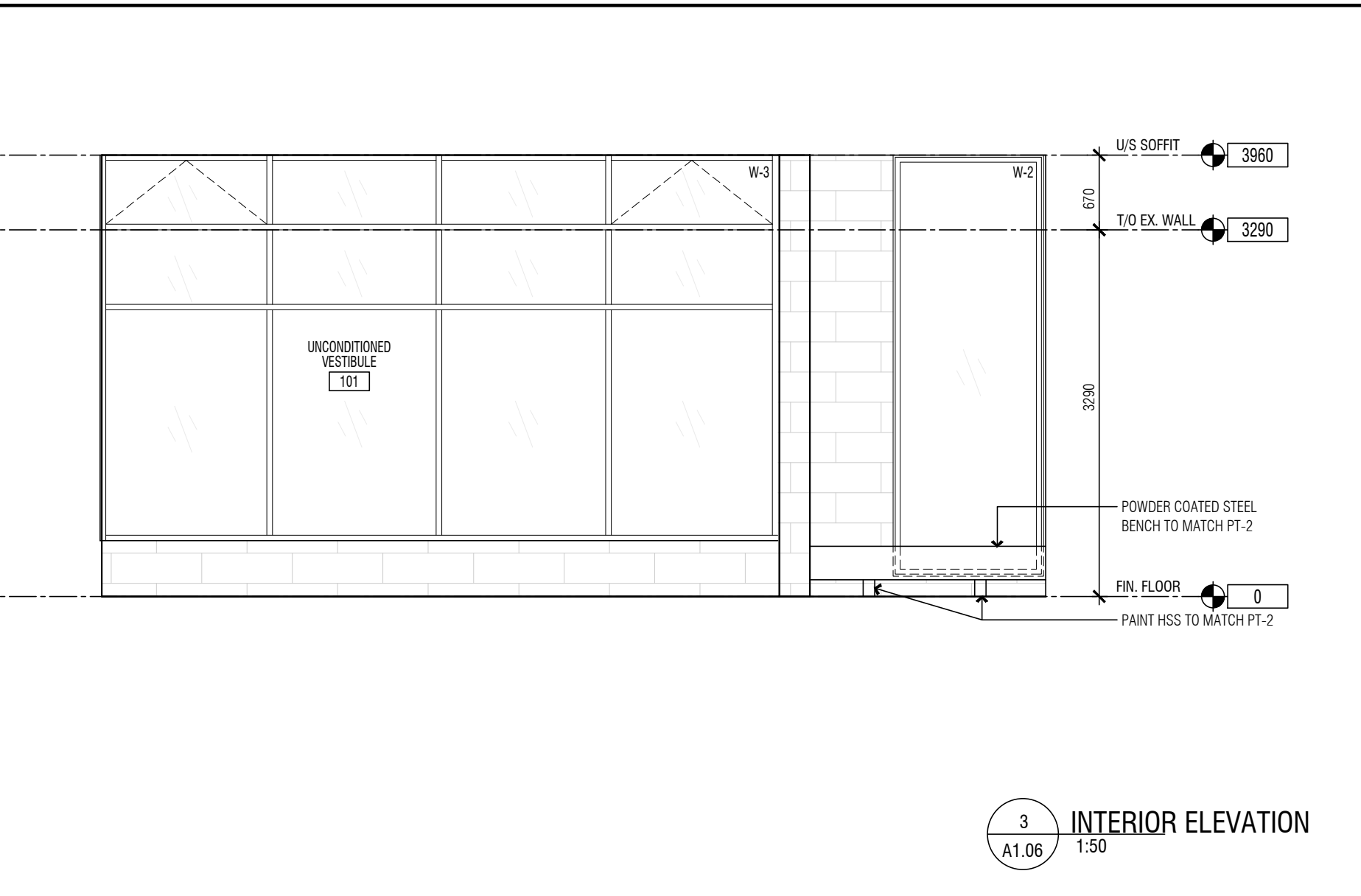
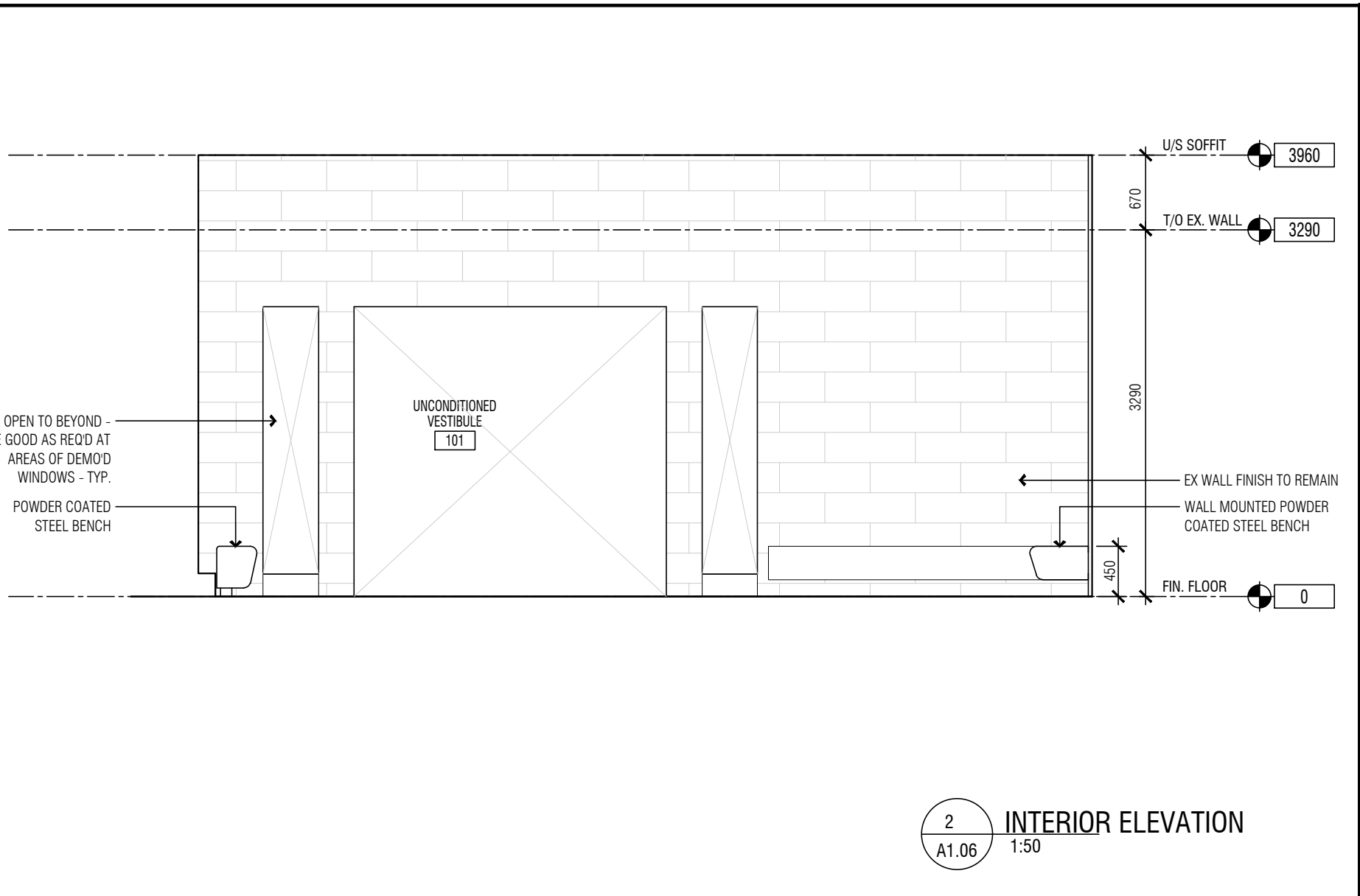
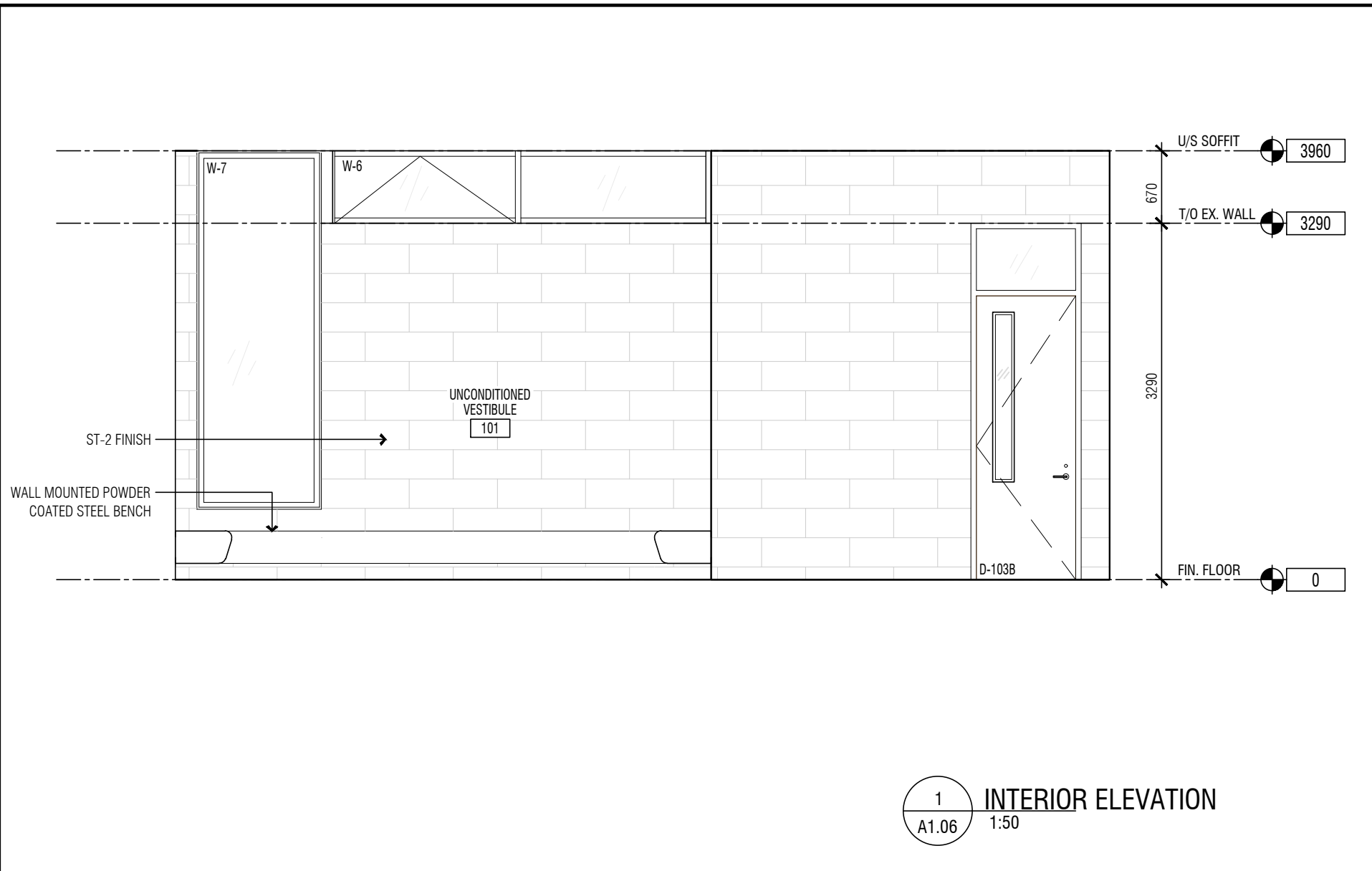


PROJECT INFORMATION KELSEY ARRIVAL CENTRE  
5234 KELSEY ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
INTERIOR ELEVATIONS

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

DRAWN BY: DS  
REVIEWED BY: AS





NO.	DESCRIPTION	DATE
01	ISSUED FOR CLIENT REVIEW	2025/02/27
02	ISSUED FOR COORDINATION	2025/03/05
03	ISSUED FOR TENDER	2025/04/09



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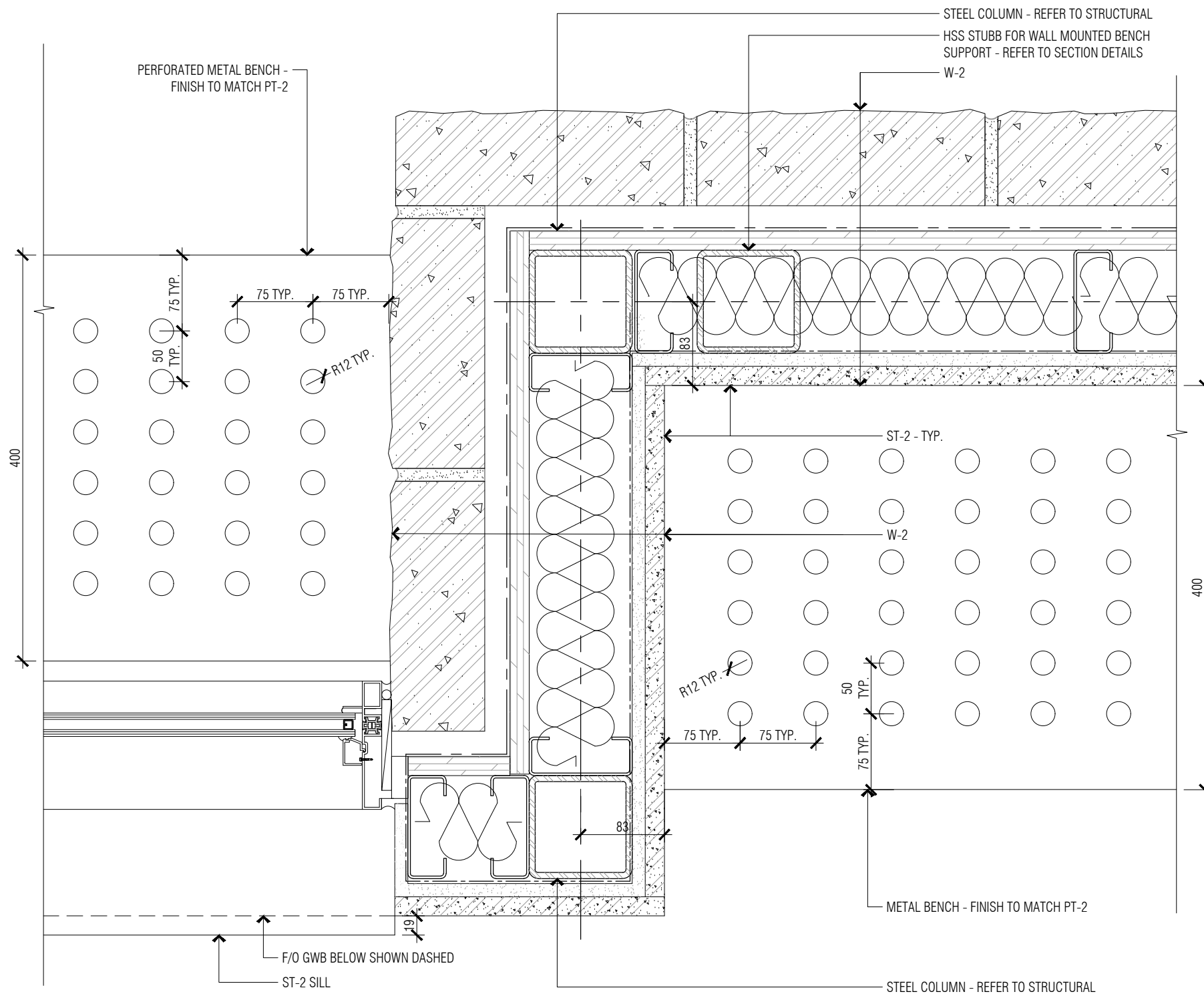


**PROJECT INFORMATION** KELS0 ARRIVAL CENTRE  
5234 KELS0 ROAD  
MILTON, ON L9E 0C6

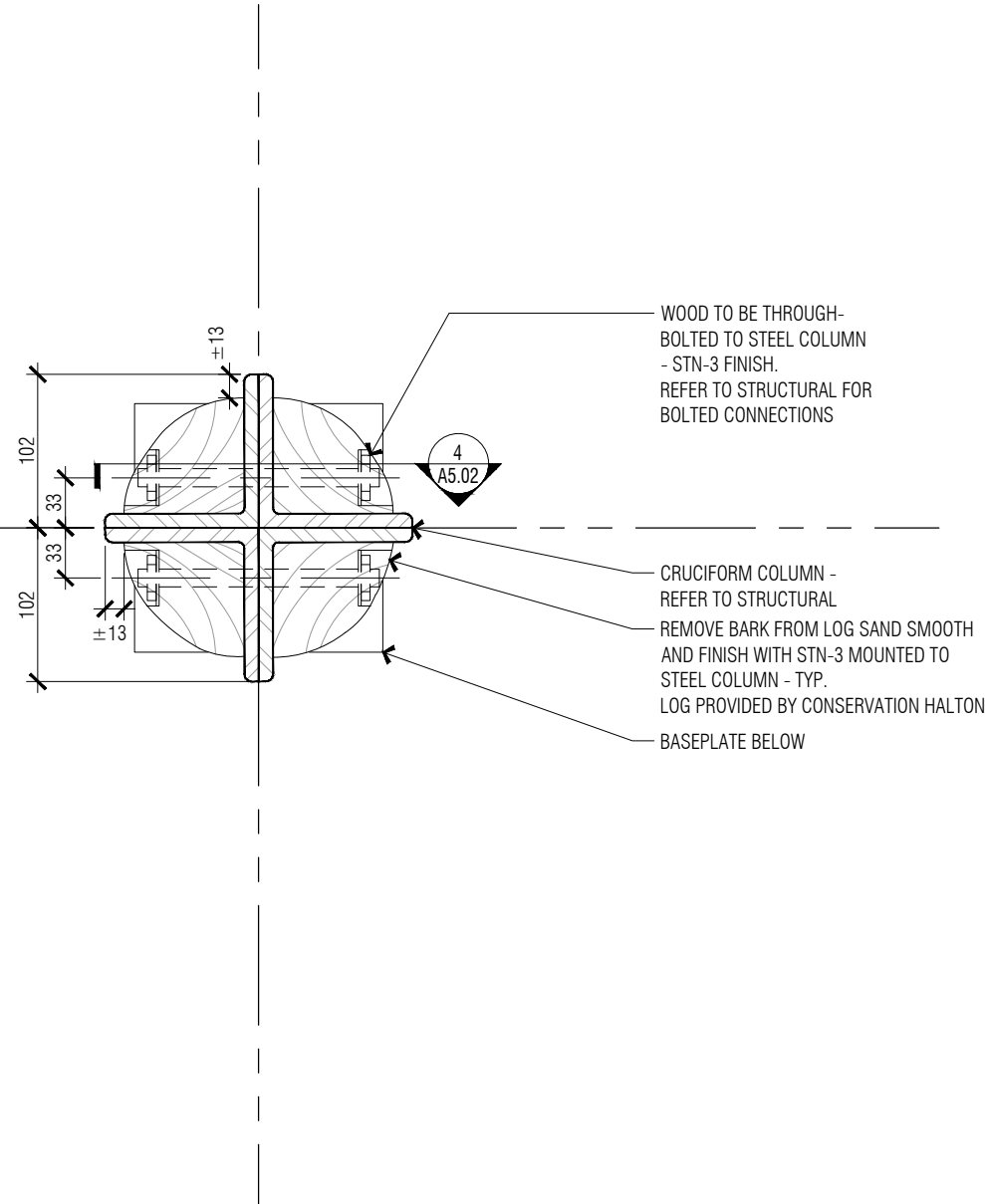
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PLAN DETAILS

**PROJECT NO.:** 24-5162  
**DATE:** 2024/07/17  
**SCALE:** AS NOTED

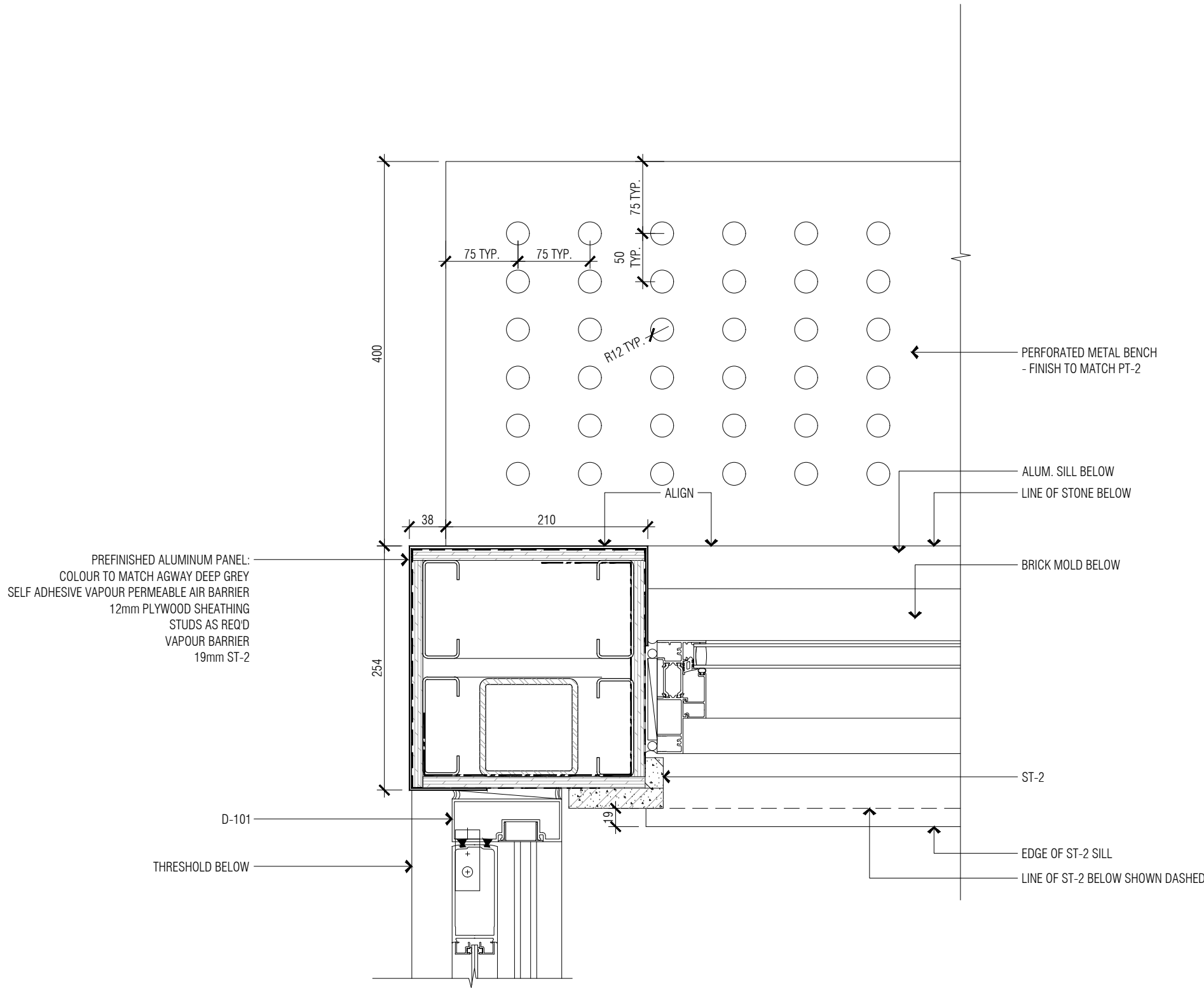
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**REVIEWED BY:** AS



1 PLAN DETAIL  
A1.06 1:5



2 CRUCIFORM COLUMN - PLAN DETAIL  
A1.06 1:5



3 PLAN DETAIL  
A1.06 1:5



NO.	DESCRIPTION	DATE
01	ISSUED FOR CLIENT REVIEW	2025/02/27
02	ISSUED FOR COORDINATION	2025/03/05
03	ISSUED FOR TENDER	2025/04/09



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PROJECT INFORMATION  
KELSO ARRIVAL CENTRE  
5234 KELSO ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
SECTION DETAILS

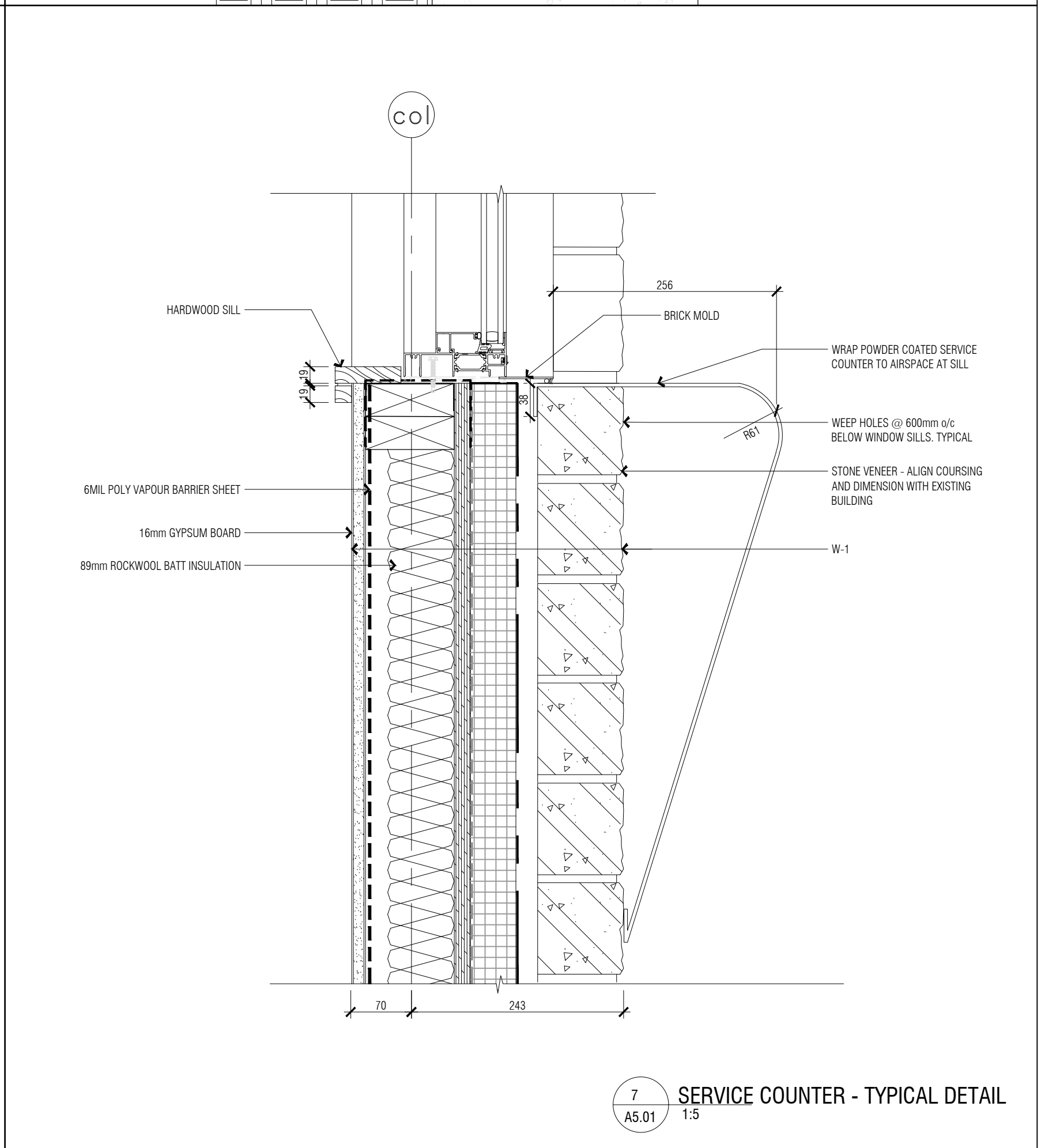
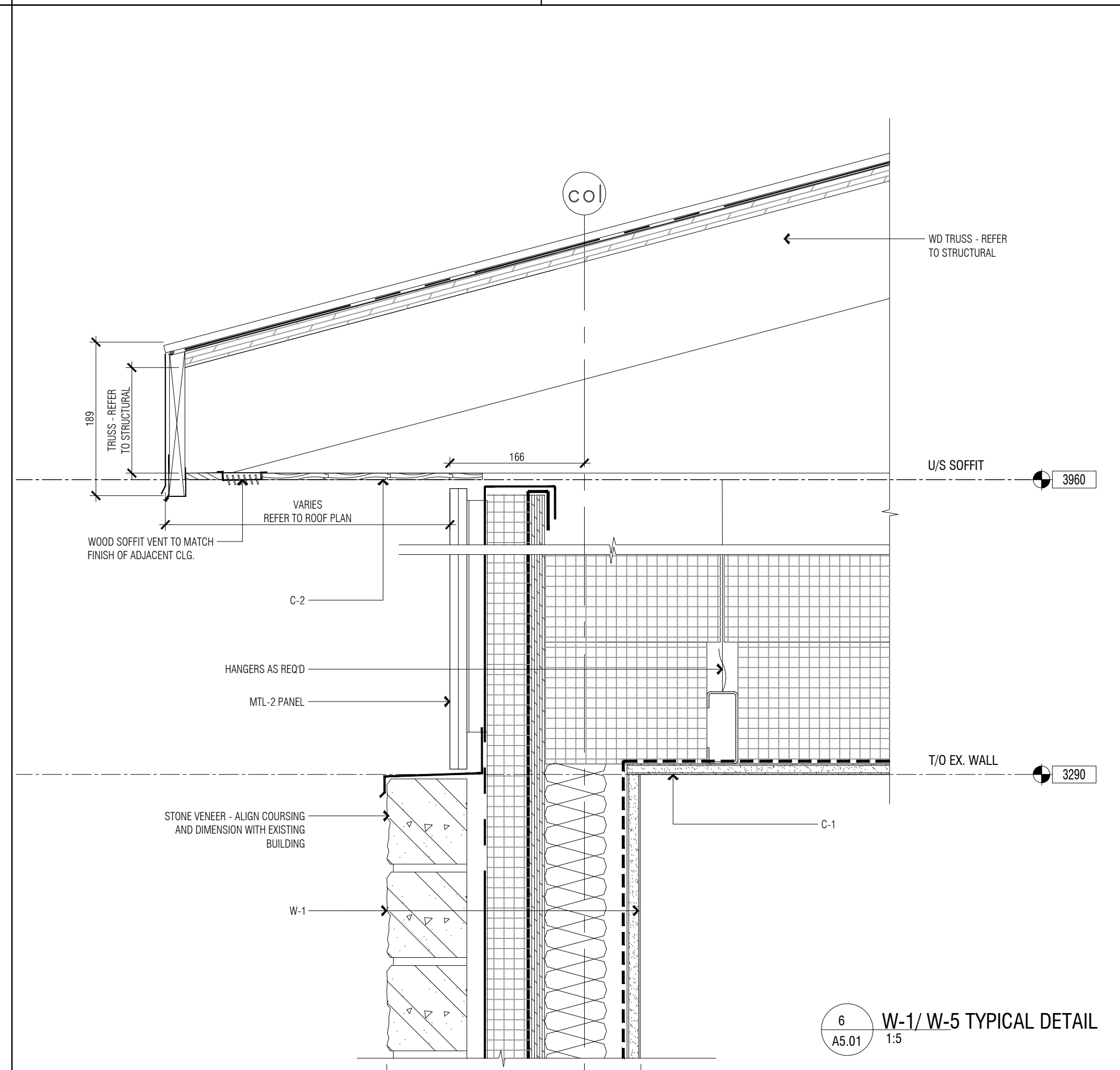
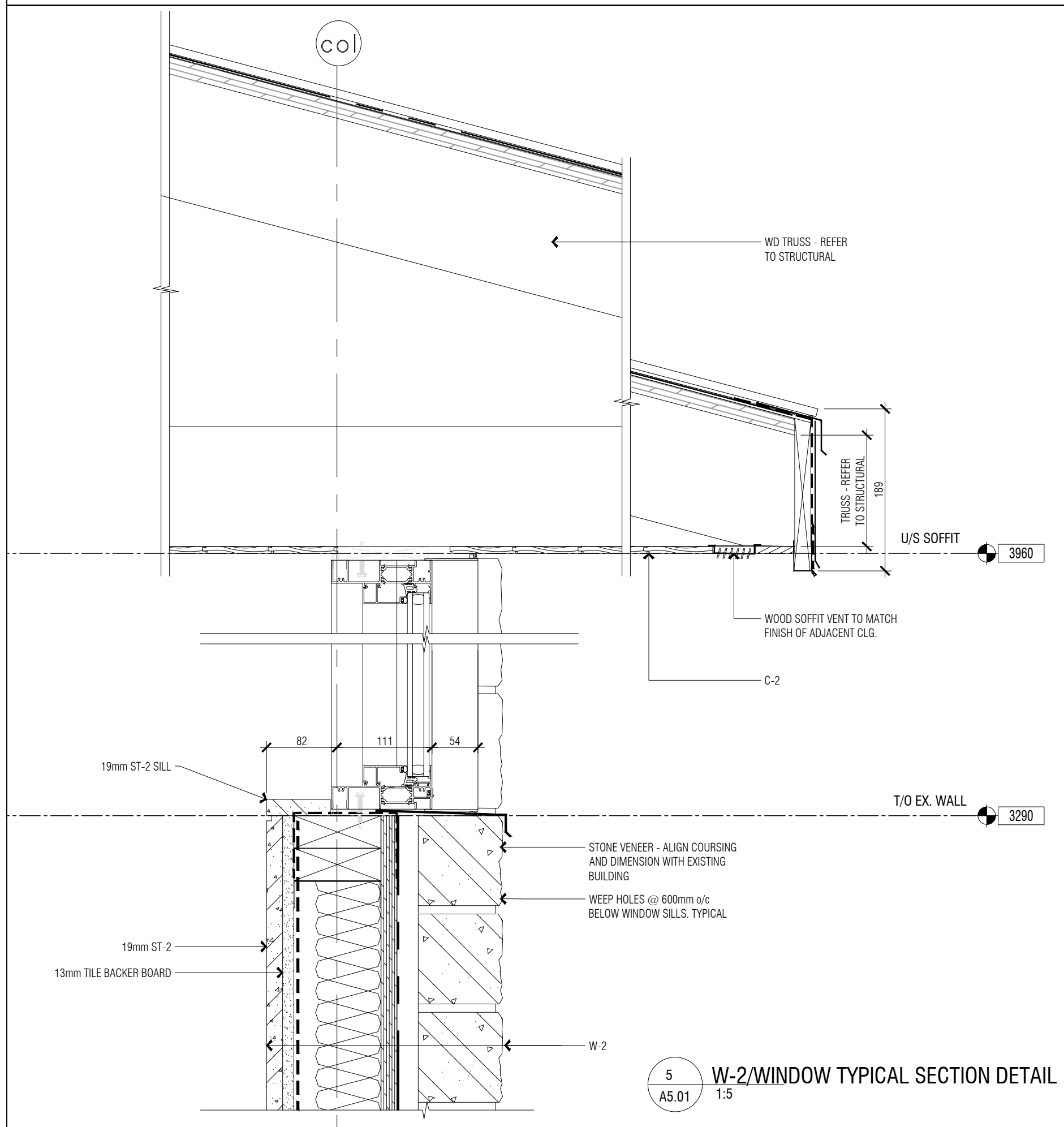
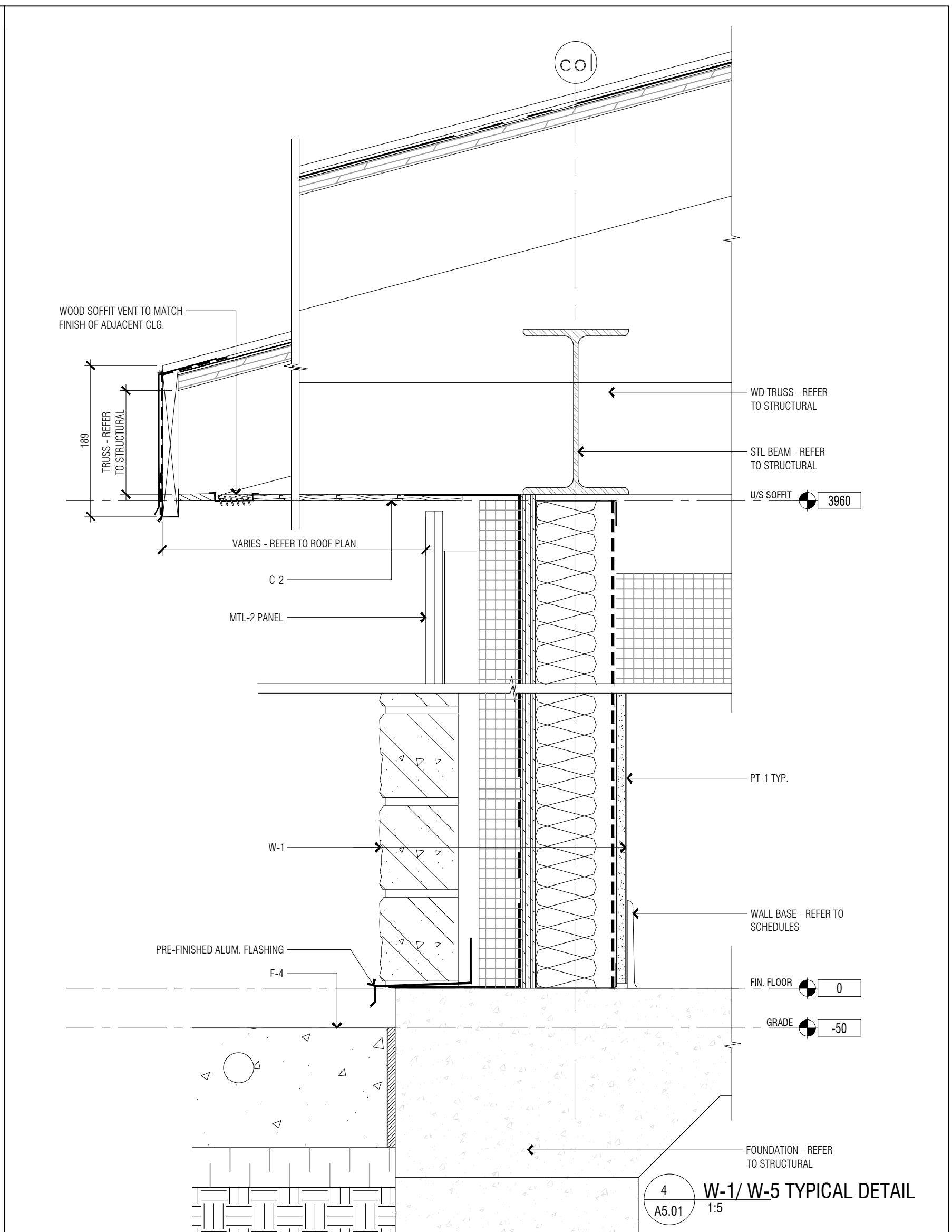
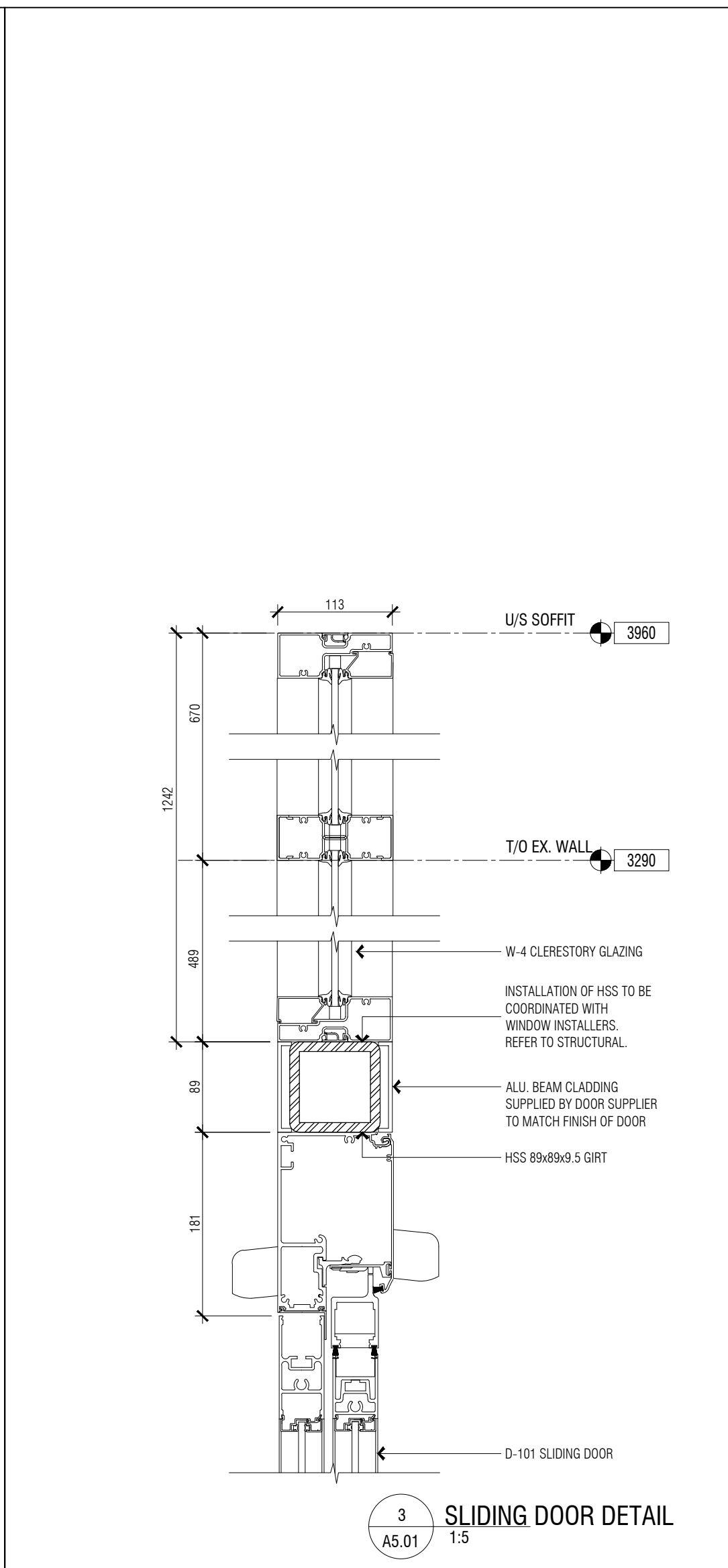
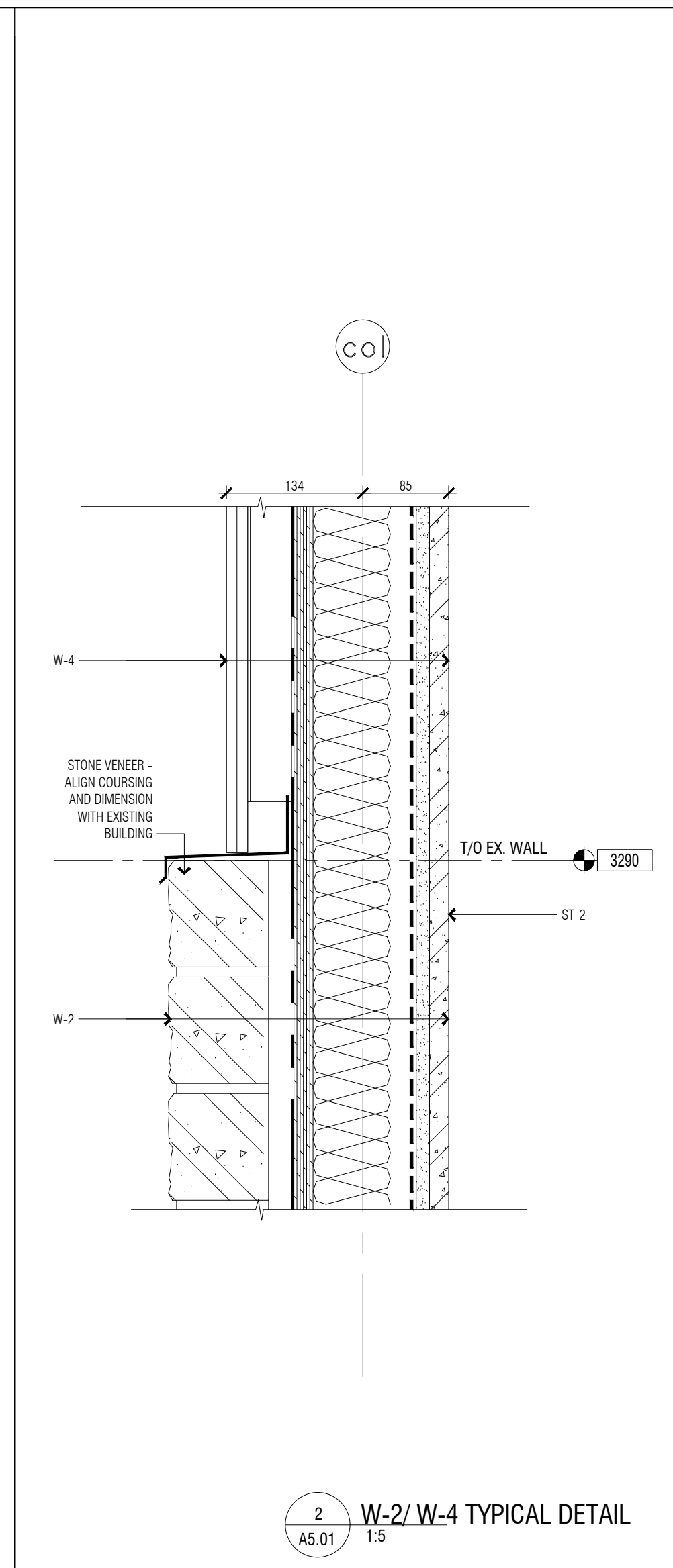
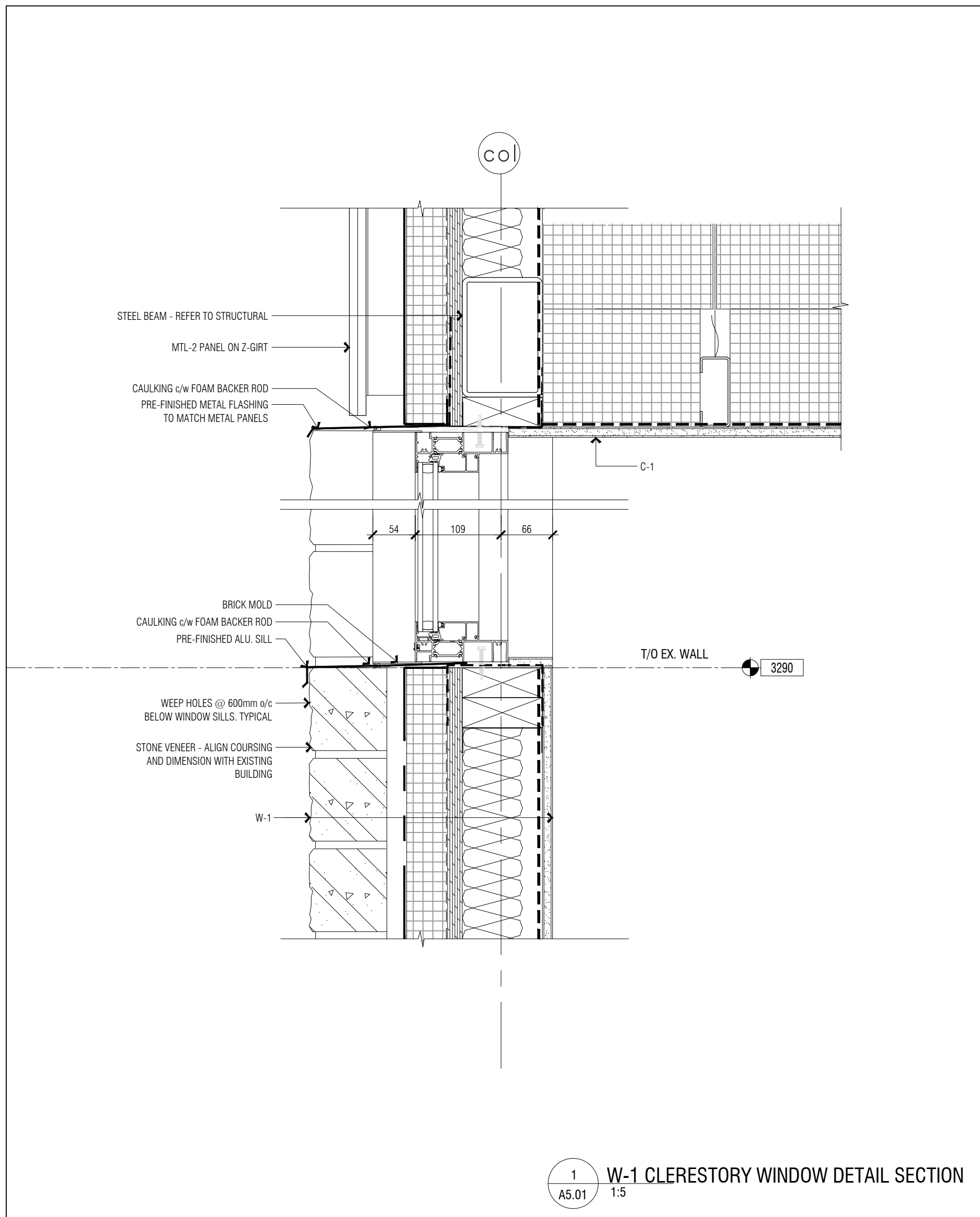
PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: AS NOTED

DRAWN BY: DS  
REVIEWED BY: AS

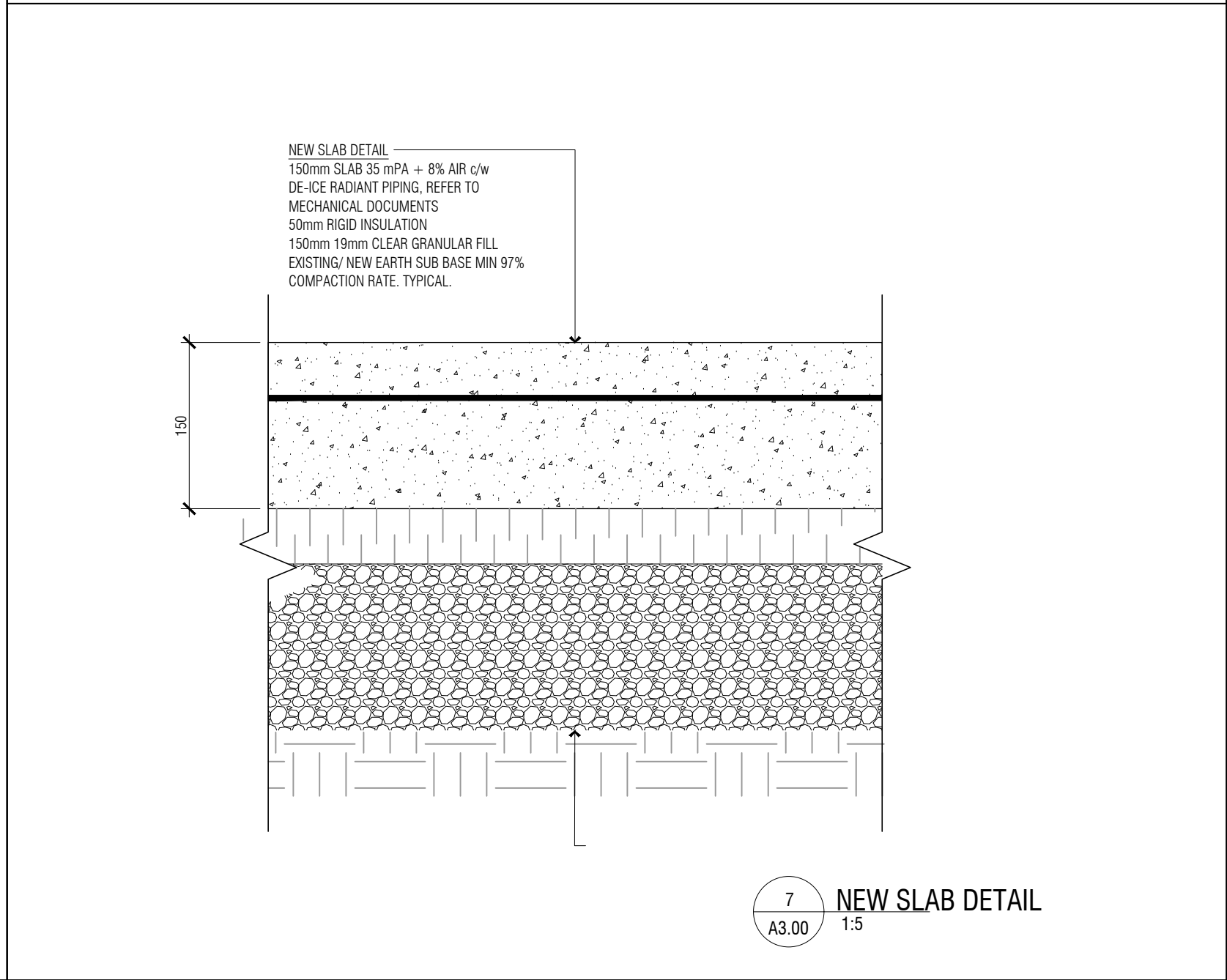
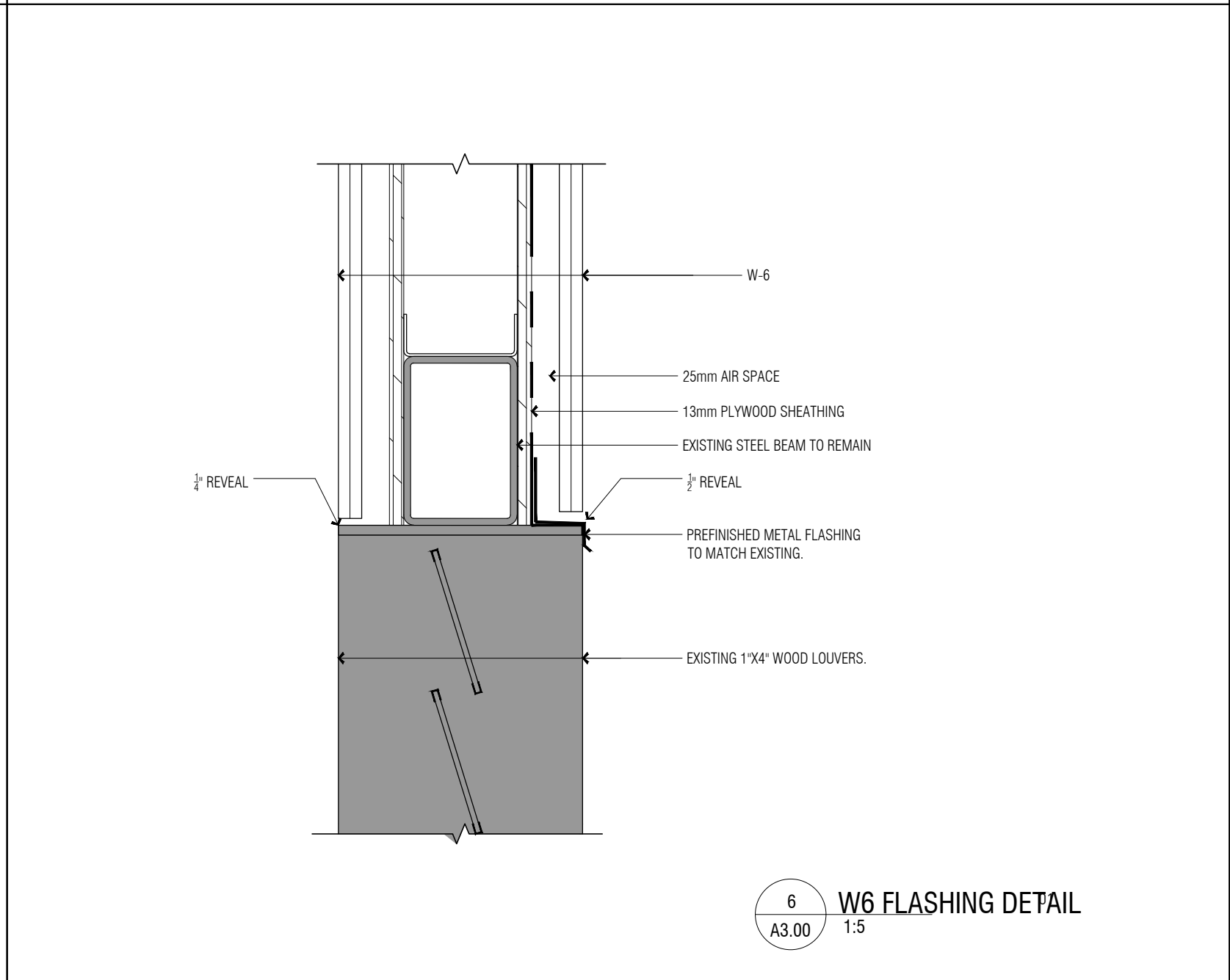
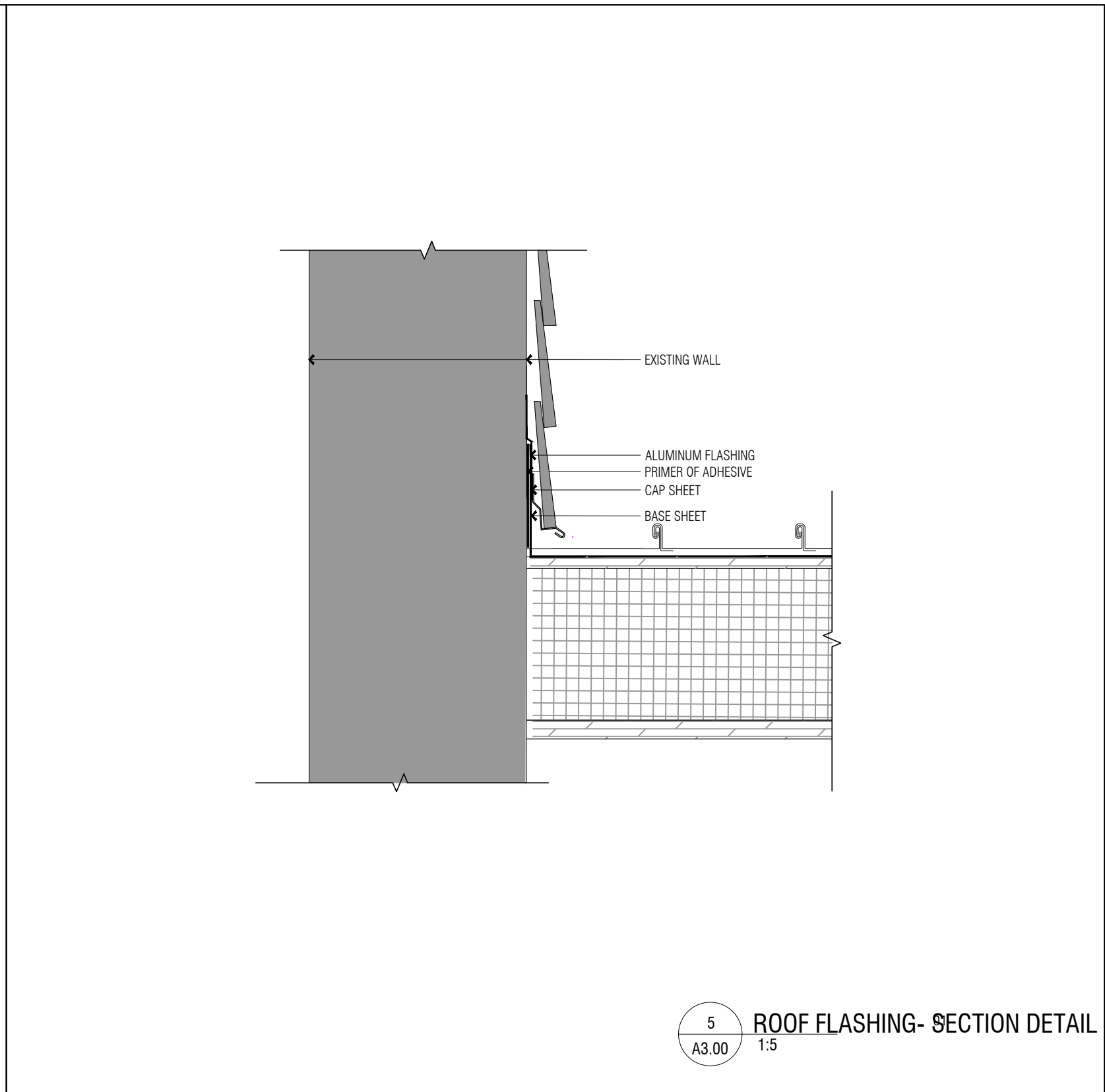
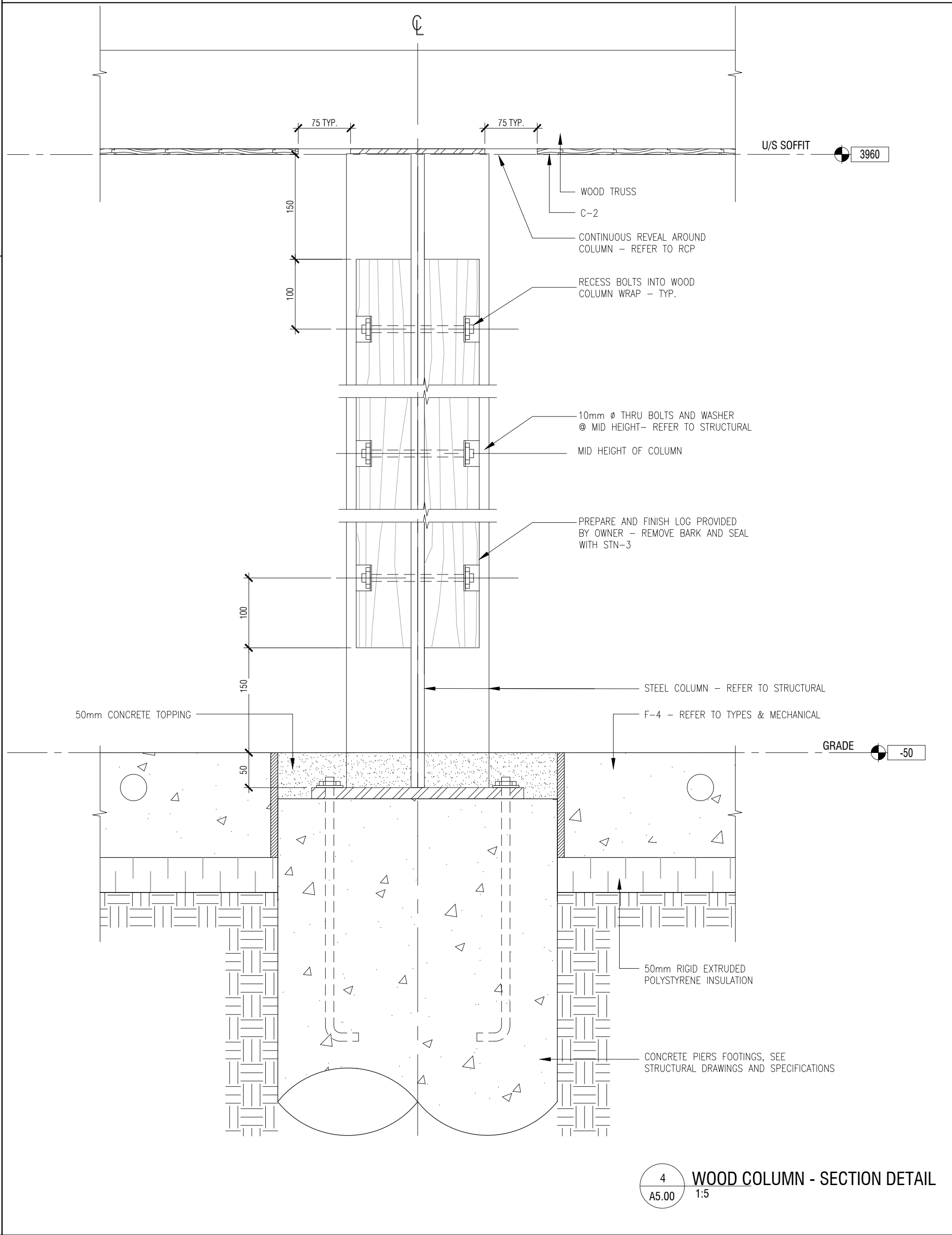
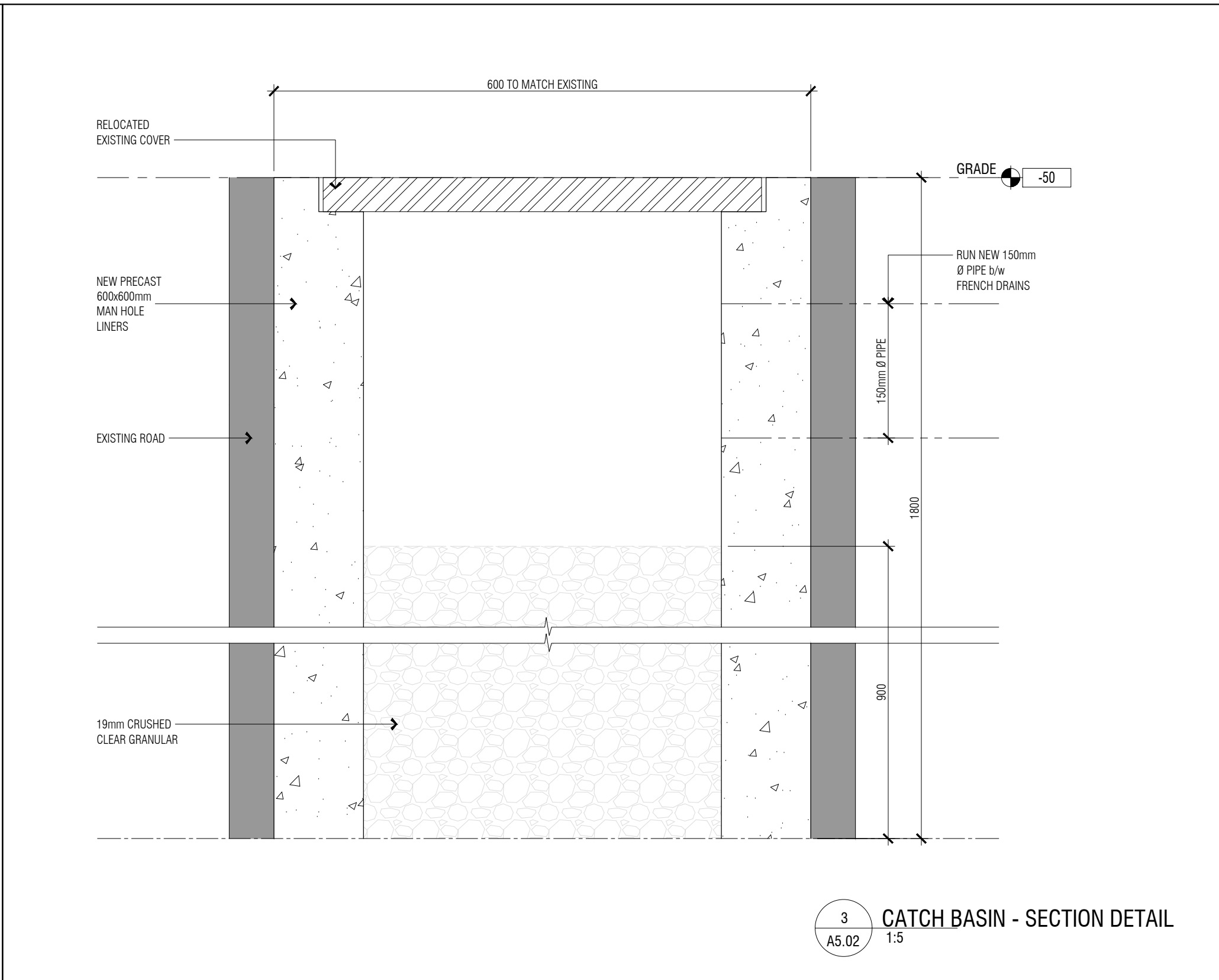
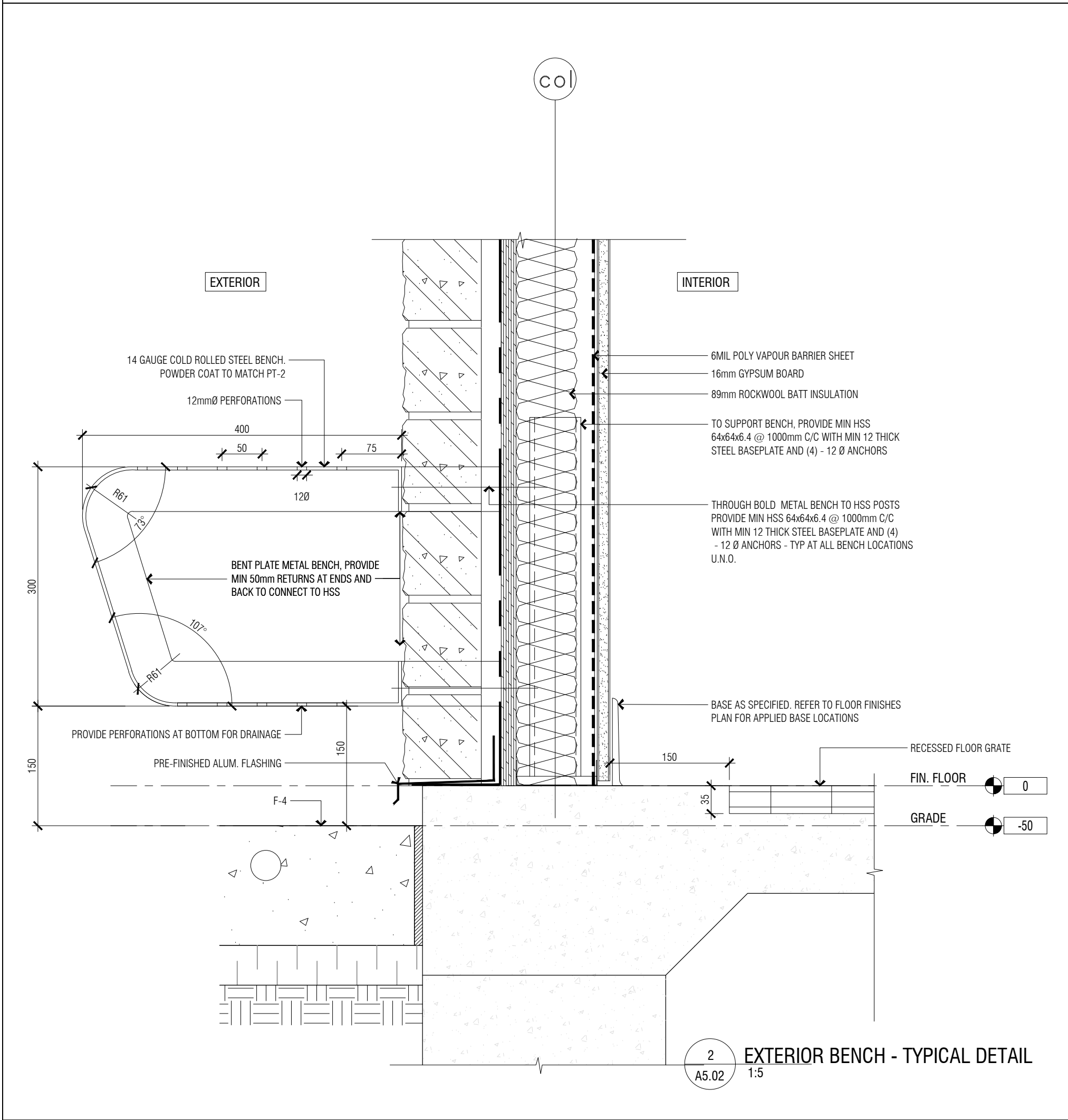
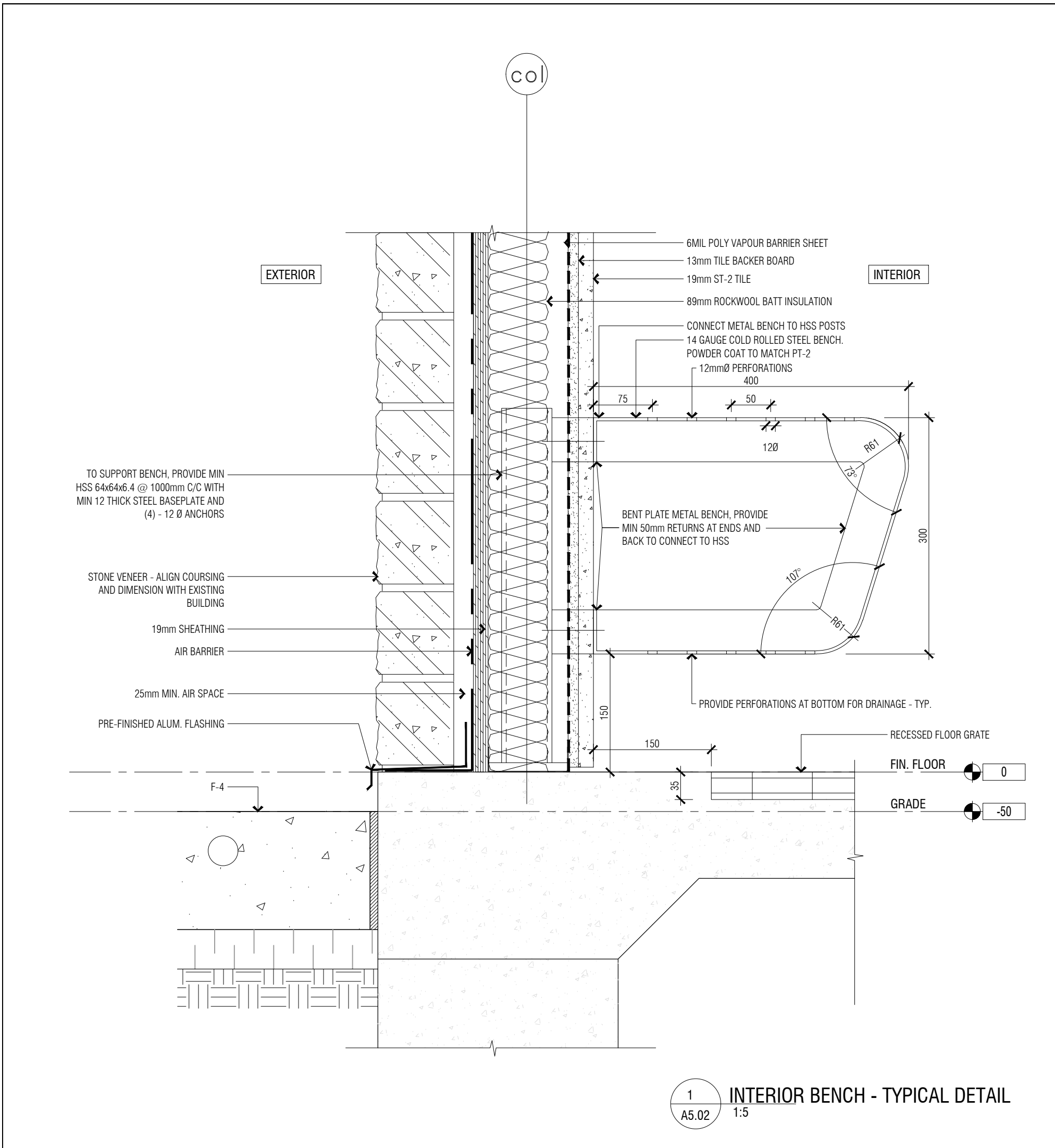
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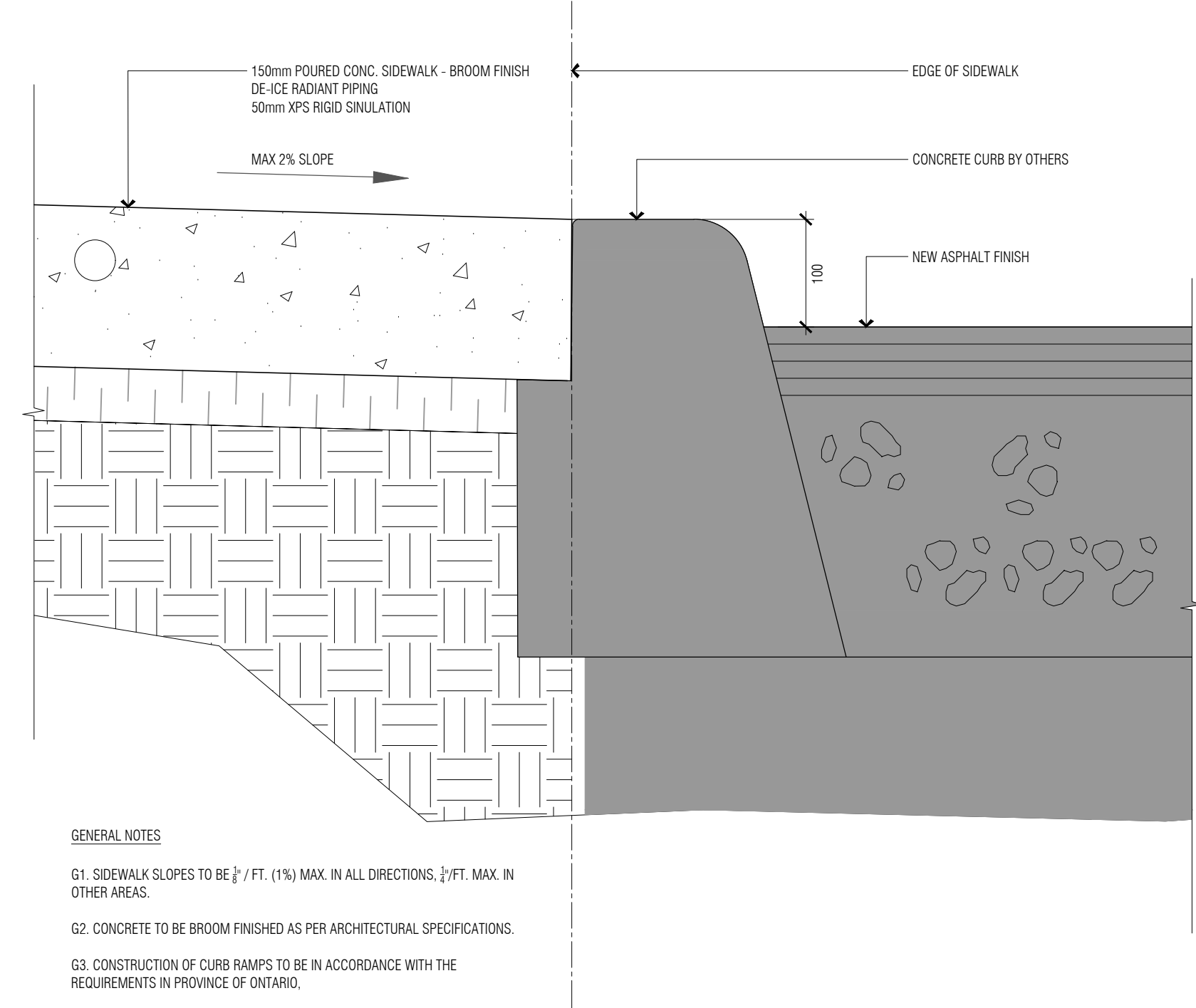
TENDER



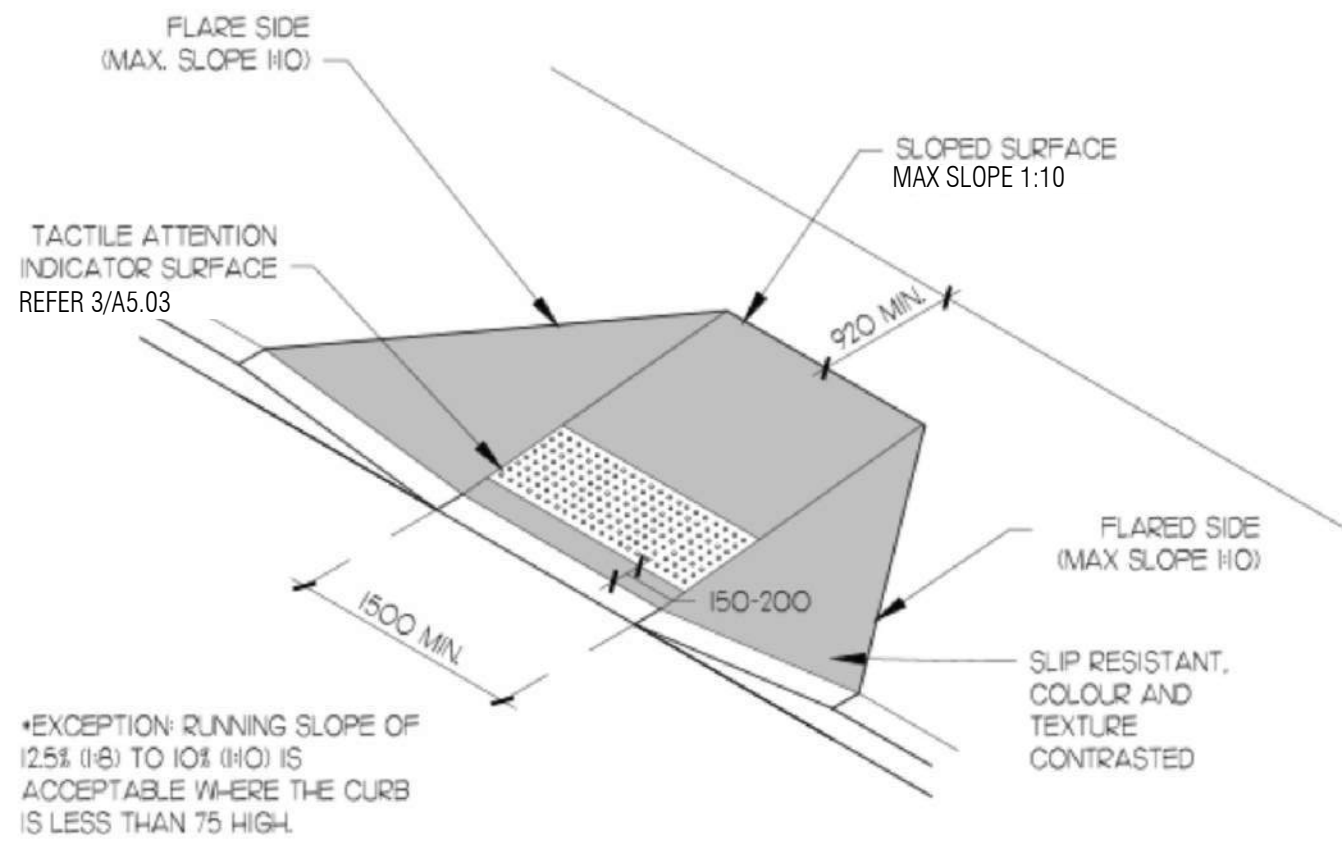




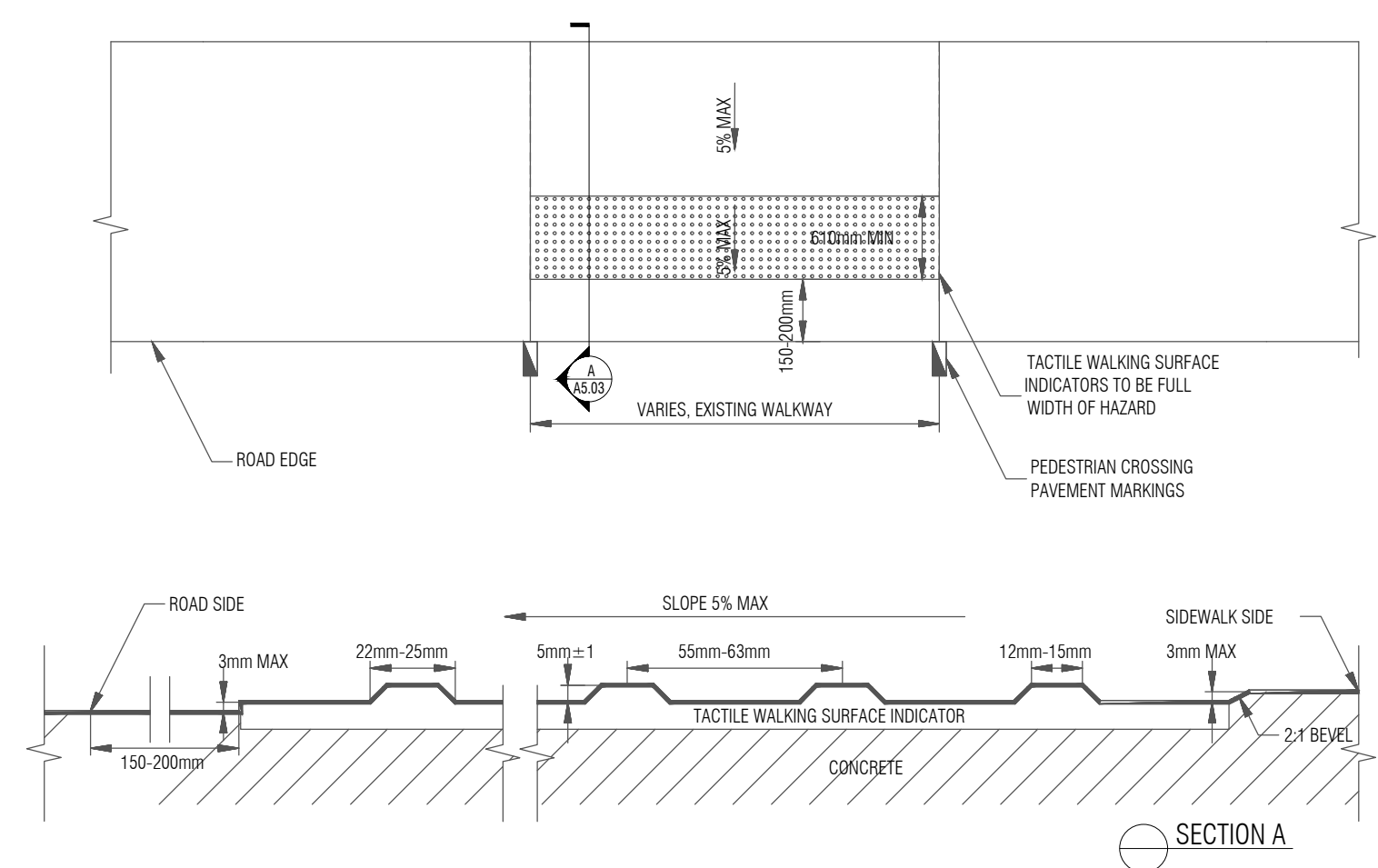
NO.	DESCRIPTION	DATE
01	ISSUED FOR TENDER	2025/04/09



1 CURB DETAIL  
A5.03 1:5



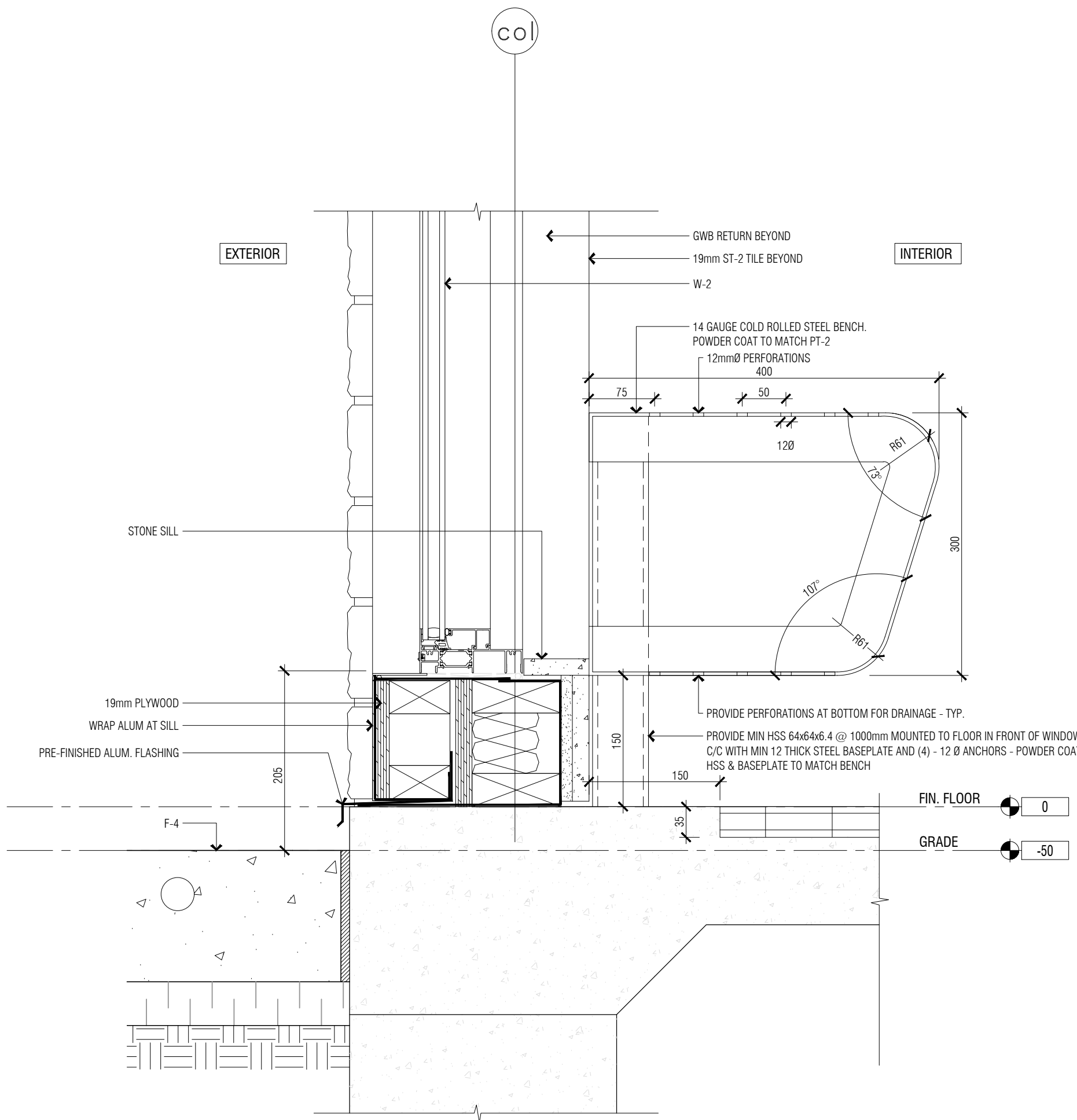
2 CURB CUT DETAIL  
A5.03 N.T.S.



ALL TACTILE WARNING STRIPS TO COMPLY WITH GUIDELINES FOR BARRIER-FREE DESIGN OF ONTARIO GOVT BUILDINGS SECTION 1.4.11, 2.4.11, AND 3.4.11

- NOTES:
- TACTILE STRIPS TO BE LOCATED AT THE TOP & BOTTOM OF ALL STAIRS AND RAMPS; WHERE ACCESSIBLE PATHS OF TRAVEL CROSS VEHICULAR ROUTES; THE BOTTOM OF CURB RAMPS AND DEPRESSED CURBS; ALONG THE EDGE OF A PLATFORM THAT IS NOT PROTECTED BY A GUARD AND MORE THAN 250mm AFF OR SLOPED STEEPER 33%
  - BE 610mm IN DEPTH; EXTEND THE FULL WIDTH OF THE HAZARD; BE SLIP RESISTANT; BE COLOUR CONTRASTED TO ADJACENT SURFACES

3 CURB CUT SECTION DETAIL  
A5.03 1:2



4 FLOOR MOUNTED BENCH DETAIL  
A5.03 1:5

# RED

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Project No. 24-1333

NO.	DESCRIPTION	DATE
01	ISSUED FOR TENDER	2025/04/09



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PROJECT INFORMATION  
KELSO ARRIVAL CENTRE  
5234 KELSO ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
SECTION DETAILS

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: AS NOTED

DRAWN BY: DS  
REVIEWED BY: AS

# A5

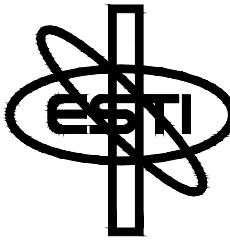
# 03

# TENDER



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NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2025/01/22
02	ISSUED FOR PERMIT	2025/02/06
△	RE-ISSUED FOR PERMIT	2025/03/18
03	ISSUED FOR TENDER	2025/04/16



PROJECT INFORMATION KELS0 ARRIVAL CENTRE  
5234 KELS0 ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE

DRAWING LIST, LOAD SUMMARY &  
SPECIFICATIONS – MECHANICAL

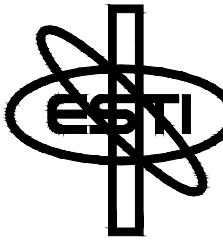
PROJECT NO.: Y25-985-B-1  
DATE: FEB. 2025  
SCALE: N/A  
DRAWN BY: CADD  
REVIEWED BY: EW

MECHANICAL SPECIFICATIONS

- General Requirements
  - This Section covers items common to all sections of Division 23 and is intended to supplement the requirements and conditions stated in the Division "0" Specifications.
  - The documents define the extent and scope of the Work but do not delegate functions or work to any specific trade.
  - The word "Provide" shall mean "supply, install and connect".
  - The Specifications are integral with the drawings which accompany them. Neither is to be used alone. Any item or subject omitted from one, but included in the other is properly specified, or shown.
  - Wherever differences occur in the Contract Documents, the maximum condition will govern and be allowed for in the Tender price. The Engineer will decide which condition to incorporate
  - Apply, obtain and pay for all required permits, licenses and inspections. Conform to requirements of the governing authorities, codes and local by-laws.
  - All work shall be done in accordance with the approved construction schedule and all specified interim schedules.
  - Clean up and remove from site, all debris created by this Division.
  - All work shall be done to the latest requirements of all relevant Standards and Codes of Authorities having jurisdiction. These are minimum requirements only and the Contract Documents are intended as supplement.
  - The Drawings are performance drawings and show the general intent of the Work. They are diagrammatic except where specific details are given.
  - The Drawings shall be used in conjunction with Drawings from all other Divisions to establish the requirements of routing and installation.
  - Obtain all dimensions from field measurement. Locations and elevations of services are approximate and must be verified on site before commencement of Work. Provide changes where required to eliminate interference.
  - Coordinate all work with all other Divisions. Inform other Divisions of the locations of openings, sleeves, chases, supports, services, connections, etc., to be incorporated into the work. Arrange the location of all new equipment and routing of all new services to be coordinated and agreed to by all other Divisions prior to installation.
  - The permanent system or any part thereof shall not be used for construction purpose without written approval from the Owner.
  - Upon completion of work, submit a written warranty for all labour, material and equipment in this contract for a period of one (1) year commencing at substantial completion.
  - Submit proper shop drawings of all specified equipment for approval.
  - On completion of the work, submit three (3) project manuals each containing data sheet, brochures, valve charts, equipment operating and maintenance information, and recommended spare parts lists. Include a "reviewed" set of shop drawings and bind in hard cover. Submit one (1) preliminary copy for review by Engineer. Make all corrections requested prior to final submission.
  - Provide all specified equipment. Substitution of any equipment will not be considered.
  - Provide all cutting, patching and flashing for mechanical services as required.
  - Flash and counter flash all pipes and ducts passing through floors. Ensure waterproof installation.
  - Provide sleeves for all new piping passing through floor slabs, beams, concrete walls, slab to slab partitions, etc.
  - All new floor and wall openings shall be sealed with approved non-shrink, waterproof and fireproof sealant.
  - Seal air tight all around ductwork and piping penetrations through partitions above ceiling.
  - Install all piping and ductwork in the best workmanlike manner and in accordance with the best practices of the trade.
  - Identify each pipe and duct run complete with directional arrows. Locate identification no more than 10m apart using 50mm high stencil lettering.
  - Provide valve tag and equipment nameplate to identify all equipment. Identify each fan, A/C unit, etc., with an engraved lamacoid nameplate, white letters on black background, mechanical attached.
  - Provide all concrete necessary for the Work of this Division. Provide 100 mm high housekeeping pad for all floor mounted equipment, extend 100 mm beyond equipment and provide chamfered edges. Provide and install all hold down bolts as required.
  - Request final inspection of the work when the completed installation has been checked, all deficiencies rectified, balancing report submitted, systems ready for operation, all equipment and fixtures cleaned.
  - This contractor and all sub-trades are responsible to repair and/or replace any existing services damaged while performing work outlined in this contract.
  - All power wiring for mechanical equipment and associated devices (starters, etc.) including connections shall be provided under Division 26 contract.
- Heating Ventilating and Air Conditioning (HVAC)
  - All ductwork construction, support and installation shall be in accordance with the latest SMACNA and ASHRAE standards. All rigid round ducts shall be of spiral construction.
  - Seal all transverse joints in all ductwork with duct sealant suitable for the system static pressure rating (2" W.G). Product shall be waterproof and suitable for freezing temperature conditions. Use of duct tape will not be accepted.
  - Provide flexible connectors between all fans and adjacent ductwork consisting of a ULC listed and labelled, pre-assembled unit with heavy glass fibre fabric, with neoprene coating equal to Duro Dyne "Duralon". Maintain a minimum 75mm gap between fan and ductwork. Connector must not be under tension.
  - Provide 25mm flexible scrim faced acoustic insulation equal to "Knaff" duct liner "M" for new supply, return and exhaust ductwork where indicated. Lining to be attached with complete coverage of adhesive and pins on maximum 600mm centres. Note that dimensions shown on drawings are clear inside dimensions. Where acoustic insulation is installed, increase dimensions accordingly.
  - Provide new diffusers and grilles as indicated on Drawings. Coordinate final locations of all diffusers, grilles and registers with the latest architectural reflected ceiling plans.
- Plumbing
  - Refrigeration piping shall be nitrogenized 'ACR' copper tubing with wrought copper fittings. All installation shall comply with the latest CSA B52 standards, all governing Codes and regulations. Provide permanent guards as required to protect piping and fittings from damage.
  - Install refrigeration piping with horizontal runs sloped towards the compressor at a rate of 4 mm per meter. Support lines at intervals of not more than 2.5 m and suitably anchored. Use rubber grommets between tubing and clamps to prevent line chafing. Where vertical runs of more than 1.5 m occur in a suction line, it shall enter at the top of the next horizontal section. Arrange piping so refrigerant or oil cannot drain from suction line into coil.
  - All refrigeration piping to remote condensing units shall include shut off valves and unions.
  - Ensure refrigeration piping is dehydrated, tested and adequately charged. The piping system will not be accepted unless it is gas tight.
  - All cold condensate drain piping shall be type "L" copper with cast brass or wrought copper fittings.
- Insulation
  - Insulate all new ventilation air ductwork, which is not internally lined, with 25mm thick flexible glass fibre insulation, 24 Kg/m3 density with fire resistive glass fibre reinforced kraft paper and aluminium foil vapour barrier.
  - Insulate all new outdoor air ductwork, which is not internally lined, with 25mm thick flexible glass fibre insulation, 24 Kg/m3 density with fire resistive glass fibre reinforced kraft paper and aluminium foil vapour barrier.
  - Recover all duct insulation in exposed areas (areas without ceiling) with 'venture clad' duct wrap.
  - Insulate all cold condensate piping and fittings with 25mm thick preformed rigid glass fibre 24 Kg/m3 density with factory applied fire resistive glass fibre reinforced kraft paper and aluminium vapour barrier with self-adhesive longitudinal joint.
  - Insulate all refrigeration piping with 25mm thick performed flexible closed cell elastomeric insulation (Armaflex). Bond insulation with elastomeric foam adhesive after slitting or joining butt ends. Recover piping located in exposed ceiling area with PVC jacket, and piping located outdoor with aluminum jacket.
  - Refer to drawings for additional insulation requirements.
- Controls
  - Provide all controls, wiring, conduit, temperature sensors, temperature controller, dampers and control transformer, and all other appurtenances necessary for a complete and operating system. Include all costs in the Tender price (including overtime costs).
  - All wiring shall be in accordance with all applicable electrical codes. All 110 volt wiring shall be in conduit. All low voltage wiring shall be plenum rated cable. The cable shall be clipped to the ceiling slab. Do not strap cable onto mechanical or electrical equipment, ceiling hangers, duct hangers or conduits.
  - This Contractor shall assist and instruct Balancing Contractor to set up all control devices and parameters.
  - Final location of thermostats and temperature sensors shall be coordinated on site with Architect and General Contractor to suit furniture layout and to avoid interference with other devices. Failure to do so may result in Contractor having to relocate any installed thermostats at his own cost.
- Testing and Balancing
  - Testing and Balancing shall be performed by an independent Testing and Balancing Contractor approved by Landlord. The independent Testing and Balancing Contractor must be a member in good standing with either National Environmental Balancing Bureau (NEBB) or Associated Air Balance Council (AABC). Include all costs in Tender price (including all overtime costs).
  - Mark the final balancing position on all balancing devices (dampers, valves, etc.) after final balancing.
  - Submit one copy of the balancing report to Engineer for review.
  - Test and balance and adjust all air systems to a tolerance of 5%. Submit report covering the following items:
    - Design and actual Make Up Air unit supply air quantity. Record unit nameplate information and actual motor and heater loading (all phases).
    - Design and actual motor loading (all phases) for all split system indoor AC units, and condensing units.
- Equipment Schedules
  - Make Up Air Unit (MAU-1): Thermolec Model X-Air FER-6--2.0-120 or equal, 31 l/s, 2 KW, 208V/1ph.
    - Air Cooled Split Air Conditioning System (AC-1/CU-1): Mitsubishi Model #PLA-A42EA8 or equal, cassette type indoor unit, 208V/1ph, MCA = 2A, 42 MBH total cooling capacity, 38.4 MBH heating capacity at -13F outdoor air, c/w remote wall mounted programmable temperature controller, indoor unit to be powered by outdoor unit. Outdoor Unit: Mitsubishi Model #PUZ-HA42NKA1 or equal, 208V/1ph, MCA = 36A, MOCP = 44A.
    - Wall Box (WB-1): Reversomatic Model SWBL-5 or equal, 125 mm intake, leak proof c/w backdraft damper and extruded aluminum grille.
    - Boiler B-1': IBC Model SL-30-199 G3 modulating condensing boiler or equal, propane operated, 439 stainless steel fire tube heat exchanger, 24V gas valve, direct spark ignition, LCD display, constructed in accordance with ANSI Z21.13-2017, CSA 4.9-2017 and ASME code and bears the H stamp as per ASME code. Boiler shall be complete with ignition, flame proving and safety monitoring including high vent temperature safety limit, fan operational control, electronic probe type manual reset low water cutoff, 95% AFUE, 32-199 MBH input, 30-181 MBH output, 120V/1ph., c/w propane conversion kit, condensate neutralization tank and flow switch.
    - Neutralizer: Neutra-Safe Model CN4B-1200C or equal, complete with limestone.
    - Glycol Circulator Pump: TACO Model 0034ePlus or equal, variable speed pump, ECM motor, suitable for 50% propylene glycol fluid, 130 F water temperature with integral check valve, 120V/1ph.  
Pump P-1: 0.95 L/s flow, 54 KPa head.  
Pump P-2: 0.61 L/s flow, 95 KPa head.  
Pump P-3: 0.14 L/s flow, 44 KPa head.
    - Propane Gas Tank: 372 L (100 gallon) propane cylinder, 689.5 KPa (100 psig) working pressure c/w all required identifying markings (Transport Canada Design Specification, tank working pressure, capacity, tare weight, tank serial number, manufacturer name, tank test date, tank retest date, etc). Provide tank level gauge, pressure gauge, fill valve, relief valve, wireless tank level monitoring sensor c/w all required tank tapings. Provide one (1) full fill (to 80% of tank volume) of propane gas (100 psig) at project completion.
    - Type 'A' door grille: EH Price Model SIG1 steel door grille or equal, BF border, colour to match door. Refer to drawing for sizes.
    - Type B' door grille: Activar Model 1900A or equal, steel fire rated door grille, colour to match door. Refer to drawing for sizes.
    - Expansion Tank: Watts Model ETX-30 or equal.
    - Glycol Feeder: Axion Model MF200 or equal, packaged glycol mixing feeder suitable for 50% propylene glycol c/w UL listed 100-240 VAC/60 hz to 24V power adaptor, pump performance: 0.04 L/m @ free flow, 25 L storage/mixing tank with molded-in liquid level gauge, 100 mm fill opening and cover, pump suction hose with inlet strainer, pressure pump with fused protection, low fluid pump output float, manual diverter for purging air and agitation tank content, pressure gauge with snubber adjustable from 70 KPa (10 psig) to 170 KPa (25 psig)
    - Funnel Floor Drain (FFD): Zum ZN-415-BF or equal with 82mm x 200mm polished bronze funnel strainer, cast iron body and seepage flange integral clamping collar.
    - Fire Extinguisher (FE): National Fire Equipment Model ABC-050E-SH, 10"-15" range, 5 lb capacity, 3-A, 10-BC ULC rating c/w wall mounting bracket.

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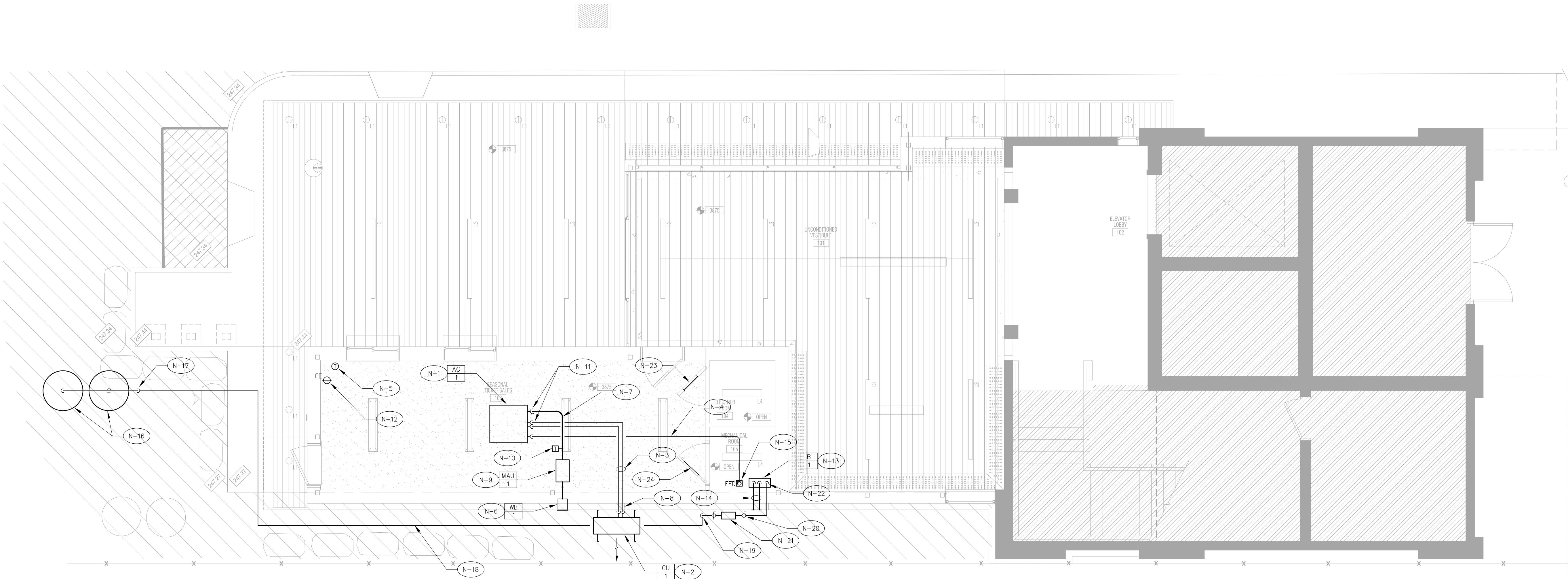


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03	ISSUED FOR TENDER	2025/04/16



GENERAL NOTES

1. FINAL LOCATION OF ALL THERMOSTATS, CONTROLLERS AND TEMPERATURE SENSORS SHALL BE COORDINATED WITH INTERIOR DESIGNER AND GENERAL CONTRACTOR TO AVOID INTERFERENCE WITH OTHER DEVICES. TEMPERATURE SENSORS, THERMOSTATS AND CONTROLLERS SHALL BE MOUNTED AT 1.2 m A.F.F. FAILURE TO DO SO MAY RESULT IN CONTROL CONTRACTOR HAVING TO RELOCATE ANY INSTALLED DEVICES AT HIS OWN COST.
2. REFRIGERATION PIPING SIZES SHOWN ON THIS DRAWING IS FOR REFERENCE ONLY. ACTUAL PIPE SIZES SHALL BE REVIEWED AND CONFIRM ON SITE WITH SYSTEM SUPPLIER BASED ON ACTUAL SITE CONDITIONS. INSULATE ALL PIPING AS SPECIFIED. REFER TO PIPING SCHEMATIC ON DRAWING M0.3 FOR FURTHER INFORMATION.

DRAWING NOTES

- N-1 INDOOR AC UNIT AS SPECIFIED. SURFACE MOUNT UNIT AT CEILING TO MANUFACTURER'S INSTRUCTIONS.
- N-2 OUTDOOR CONDENSING UNIT AS SPECIFIED. MOUNT UNIT ON TWO 40 mm WIDE STEEL ANGLE BRACKETS TO MANUFACTURER'S INSTRUCTIONS. ANCHOR BRACKETS ON BUILDING WALL AT 900 mm ABOVE GRADE.
- N-3 REFRIGERATION PIPING TO AND FROM INDOOR UNIT AND CONDENSING UNIT IN CEILING PLENUM. REFER TO GENERAL NOTE #2 FOR FURTHER INFORMATION.
- N-4 PIPE AND TERMINATE DRAIN OVER FUNNEL FLOOR DRAIN IN MECHANICAL ROOM.
- N-5 PROGRAMMABLE THERMOSTAT CONTROLLING AC UNIT. REFER TO GENERAL NOTE #1 FOR FURTHER INFORMATION.
- N-6 WALL BOX AS SPECIFIED. MOUNT BOX FLUSH WITH OUTSIDE WALL. INSULATE BOX WITH 25mm THICK THERMAL DUCT INSULATION AND SEAL WALL OPENING AS REQUIRED. REFER TO ARCHITECTURAL DRAWING FOR LOCATION.
- N-7 125ø RIGID ROUND OUTDOOR AIR DUCT IN CEILING PLENUM. CONNECT DUCT TO WALL BOX C/W DUCT TRANSITION. INSULATE DUCT AS SPECIFIED.
- N-8 PIPE SLEEVE THROUGH WALL. PACK AND SEAL OPENING WITH APPROVED MATERIAL. TYPICAL.
- N-9 MAKE-UP AIR UNIT AS SPECIFIED. INSTALL UNIT IN CEILING PLENUM. BALANCE TO 31 L/S. INTERLOCK UNIT WITH AC UNIT SO THAT BOTH UNITS WILL START/STOP TOGETHER. PROVIDE 450 x 450 mm PRIME PAINTED TRIMLESS METAL ACCESS PANEL FOR DRYWALL MOUNTING AND HAND OVER TO GENERAL CONTRACTOR FOR MOUNTING ON NEW CEILING.
- N-10 DUCT MOUNTED TEMPERATURE SENSOR. SENSOR TO CONTROL MAKE UP AIR UNIT ELECTRIC HEATER TO MAINTAIN 20°C SUPPLY AIR TEMPERATURE.
- N-11 PIPE/DUCT DROP/RISE. TYPICAL.
- N-12 NEW FIRE EXTINGUISHER AS SPECIFIED. CONFIRM EXACT LOCATION WITH ARCHITECT AND LOCAL FIRE DEPARTMENT PRIOR TO INSTALLATION. MOUNTING HEIGHT TO CODE REQUIREMENT.
- N-13 MOUNT SPECIFIED BOILER ON WALL AT 1.5 m AFF TO MANUFACTURER'S INSTRUCTION. CONTRACTOR TO PROVIDE A 50 LITER PLASTIC CONTAINER NEXT TO BOILER. PIPE AND TERMINATE RELIEF IN CONTAINER.
- N-14 75ø CPVC BOILER COMBUSTION AIR INTAKE AND BOILER EXHAUST FLUE PIPES. TERMINATE PIPES ON OUTSIDE WALL TO MANUFACTURER'S INSTRUCTION AND TO CODE REQUIREMENT. PACK AND SEAL WALL OPENINGS AS REQUIRED.
- N-15 75ø FUNNEL FLOOR DRAIN AS PECIFIED. PIPE DRAIN (WITHOUT TRAP) AND TERMINATE OVER FRENCH DRAIN PROVIDED BY GENERAL CONTRACTOR.
- N-16 SET SPECIFIED PROPANE TANK (TOTAL OF 2) ON 40 mm (1-1/2") THICK PAVING STONES. TWIN TANKS TOGETHER AS REQUIRED C/W ISOLATION VALVES AT EACH TANK. ALL INSTALLATION TO CODE REQUIREMENTS AND TO TSSA REGULATIONS. TANKS SHALL BE LOCATED A MINIMUM OF 3.05 m FROM BUILDING AND 3.05 m FROM PROPERTY LINE. SECURITY FENCE BY GENERAL CONTRACTOR.
- N-17 DROP 25ø PROPANE GAS PIPE DOWN TO BELOW GRADE.
- N-18 25ø BURIED PROPANE GAS SUPPLY TO SERVE BOILER. PLACE GAS LINE IN A PVC SLEEVE TO PREVENT CORROSION AND WRAP SLEEVE WITH TRACE WIRE AS REQUIRED. PIPING TO BE BURIED AT 450 mm BELOW FINISHED GRADE. EXCAVATION, TRENCHING AND BACKFILLING BY GENERAL CONTRACTOR. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION.
- N-19 RAISE PIPE AND RUN PIPE AGAINST WALL TO CONNECT TO BOILER. SECURE PIPE AGAINST WALL AS REQUIRED. PACK AND SEAL WALL OPENING AS REQUIRED.
- N-20 CGA APPROVED SHUT OFF VALVE, TYPICAL.
- N-21 PRESSURE REGULATOR (TO 11" WG, ADJUSTABLE).
- N-22 CONNECT 25ø GAS LINE TO BOILER C/W CGA APPROVED SHUT OFF VALVE.
- N-23 MECHANICAL CONTRACTOR TO SUPPLY TWO (2) TYPE 'A' DOOR GRILLES OF SIZE 450 x 300 AND HAND OVER GRILLES TO GENERAL CONTRACTOR FOR MOUNTING ON DOOR, ONE (1) GRILLE AT 1500 mm AFF AND ONE (1) GRILLE AT 300 mm AFF.
- N-24 MECHANICAL CONTRACTOR TO SUPPLY TWO (2) TYPE 'B' DOOR GRILLES OF SIZE 450 x 300 AND HAND OVER GRILLES TO GENERAL CONTRACTOR FOR MOUNTING ON DOOR, ONE (1) GRILLE AT 1500 mm AFF AND ONE (1) GRILLE AT 300 mm AFF.

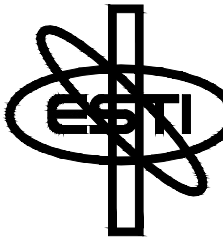


PROJECT INFORMATION KESLO ARRIVAL CENTRE  
5234 KESLO ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
MECHANICAL LAYOUT

PROJECT NO.: Y25-985-B-1  
DATE: FEB. 2025  
SCALE: 1 : 50

DRAWN BY: CADD  
REVIEWED BY: EW

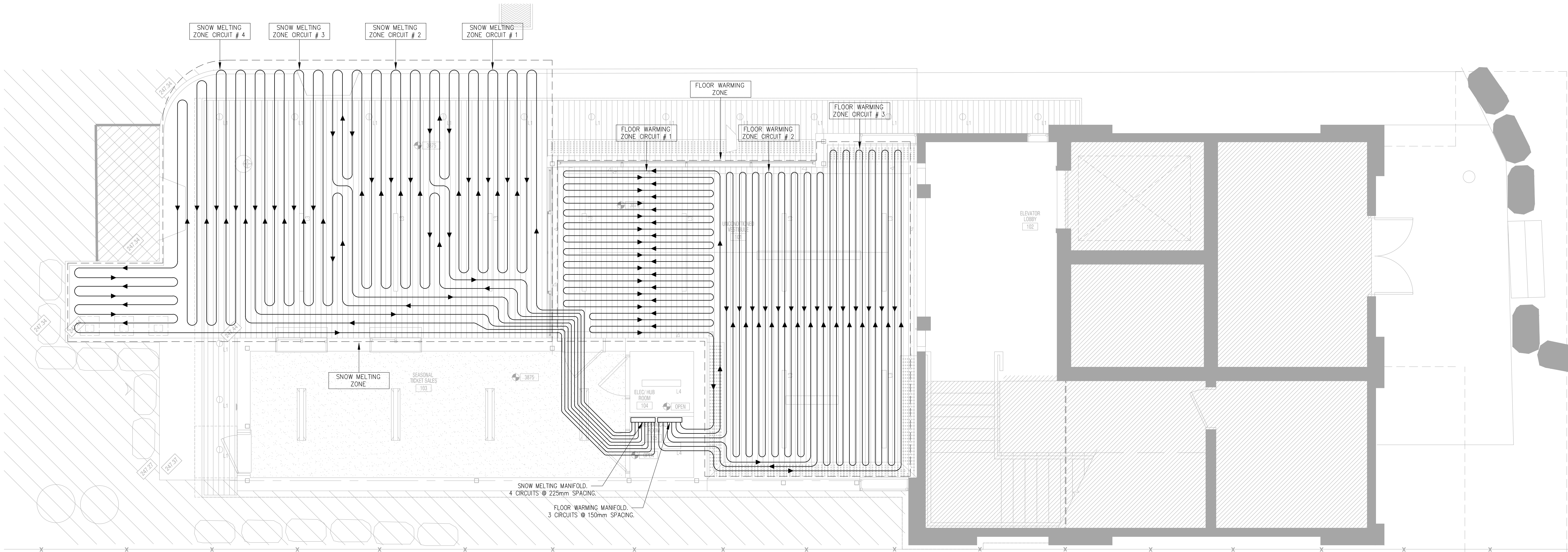


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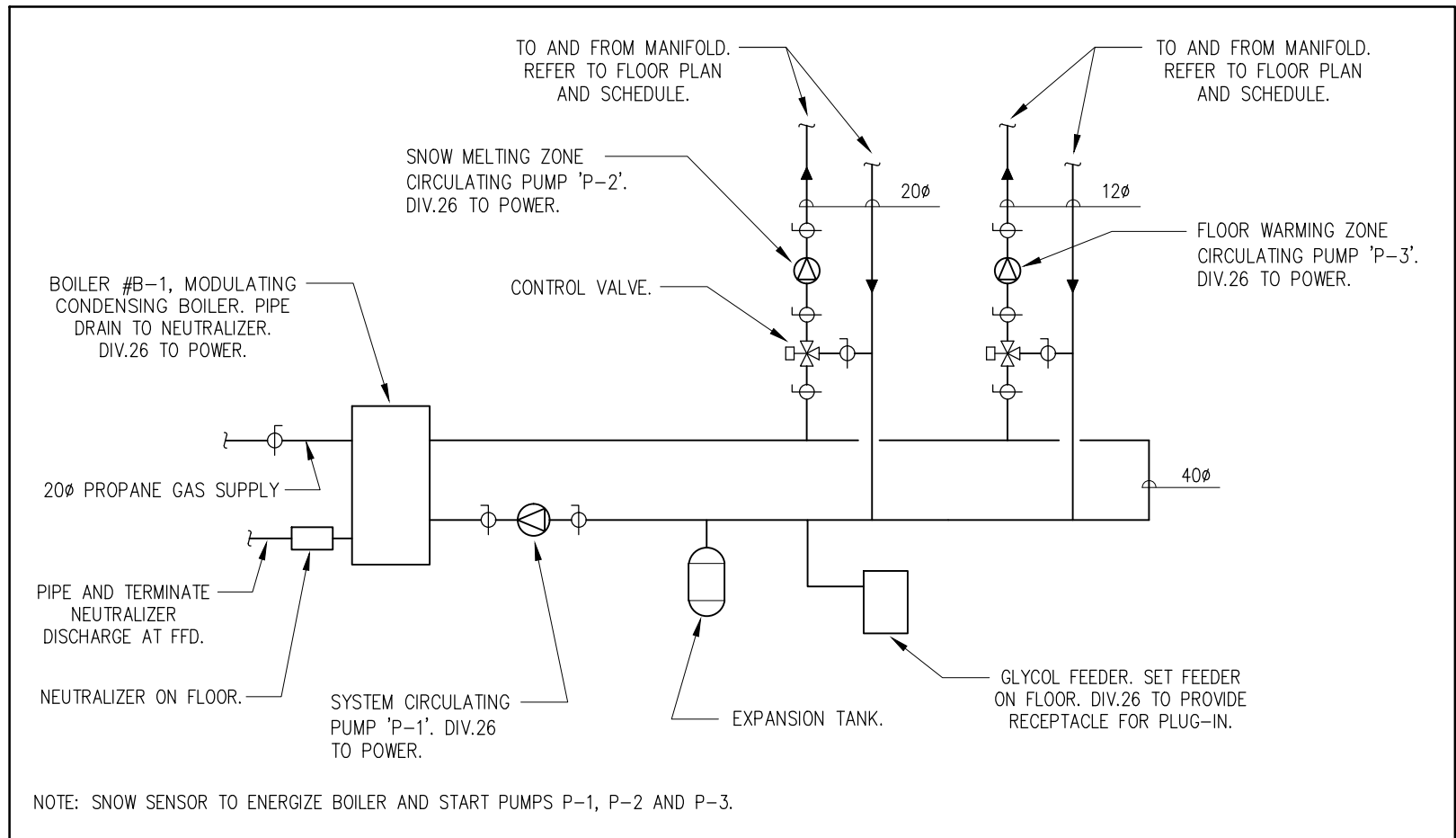
1 SYSTEM PIPING DISTRIBUTION LAYOUT  
M-3 SCALE: 1 : 50

RADIANT FLOOR HEATING SYSTEM MANIFOLD INFORMATION									
Circuit	Serving	Approx. Tube Length (m)	Tube Size (mm)	Approx. Area Served (sq. m)	Flow Rate (L/s)	Head Loss (KPa)	Water Temp (C)	Design Temp. Drop	Load (KW)
Circuit #1	Vestibule	100	12	15.6	0.045	17.20	54.4	11.1	2.28
Circuit #2	Vestibule	100	12	16.3	0.045	17.20	54.4	11.1	2.28
Circuit #3	Vestibule	115	12	17.6	0.045	17.20	54.4	11.1	2.28
Total		315		49.5	0.135				6.84

SNOW MELTING SYSTEM MANIFOLD INFORMATION									
Circuit	Serving	Approx. Tube Length (m)	Tube Size (mm)	Approx. Area Served (sq. m)	Flow Rate (L/s)	Head Loss (KPa)	Water Temp (C)	Design Temp. Drop	Load (KW)
Circuit #1	Line Up Area	80	20	14.0	0.14	46.00	54.4	16.67	8.2
Circuit #2	Line Up Area	80	20	14.0	0.14	46.00	54.4	16.67	8.2
Circuit #3	Line Up Area	80	20	14.0	0.14	46.00	54.4	16.67	8.2
Circuit #4	Line Up Area	100	20	17.7	0.19	62.50	54.4	16.67	10.8
Total		340		59.7	0.61				35.4

#### GENERAL NOTE

SNOW MELTING SYSTEM, FLOOR WARMING SYSTEM LAYOUTS AND MANIFOLD INFORMATION ARE BASED ON WATTS PEX HEATING SYSTEM AND ARE SHOWN ON THIS DRAWING FOR REFERENCE ONLY. FINAL SYSTEM SUPPLIER SHALL BE RESPONSIBLE FOR THE FINAL SYSTEM LOOP DESIGN AND LAYOUT. SYSTEM SHALL INCLUDE BUT NOT LIMITED TO PEX TUBING (REFER TO LAYOUT FOR TUBE SIZES), STAINLESS STEEL HI-FLOW FLOW METER, MANIFOLDS, CABINETS, ZONE CIRCULATING PUMPS, SYSTEM CIRCULATING PUMP, CONTROL VALVES, SNOW/IC SENSOR AND SOCKETS (TOTAL OF 2), FLOOR TEMPERATURE SENSOR AND SOCKETS (TOTAL OF 2), PROMET SMART CONTROLLER, SHUT-OFF VALVES, CABLE TIES AND ALL OTHER REQUIRED ACCESSORIES FOR A COMPLETE OPERATING SYSTEM. SNOW SENSORS TO ENERGIZE BOILER AND ACTIVATE PUMPS P-1 TO P-3 INCLUSIVE. BOILER SUPPLY WATER TEMPERATURE TO BE SET AT 64.4°C (150°F). FLOOR TEMPERATURE SENSORS (LOCATED IN FLOOR WARMING ZONE) TO DE-ACTIVATE PUMP P-3 WHEN FLOOR TEMPERATURE EXCEEDS 26.7°C (80°F) AND RE-ACTIVATE PUMP P-3 WHEN FLOOR TEMPERATURE DROPS BELOW 25°C (77°F).



3 SYSTEM PIPING SCHEMATIC  
M-3 SCALE: N/A



PROJECT INFORMATION KESLO ARRIVAL CENTRE  
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DRAWING TITLE  
SNOW MELTING SYSTEM LAYOUT  
AND SCHEMATIC

PROJECT NO.: Y25-985-B-1  
DATE: FEB. 2025  
SCALE: 1 : 50  
DRAWN BY: CADD  
REVIEWED BY: EW



# ARRIVAL CENTRE

5234 Kelso Road  
Milton L6E 0C6

## ELECTRICAL DRAWINGS ISSUED FOR TENDER

### GENERAL NOTES

1.

GENERAL
- 1.1

THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH DESIGN CONSULTANT'S/ARCHITECTS DRAWINGS FOR DIMENSIONS, FINISHES AND MOUNTING HEIGHTS OF DEVICES, ETC.
- 1.2

REFER ALSO TO COMMUNICATIONS, SECURITY, A/V, AND MECHANICAL DRAWINGS FOR ADDITIONAL DETAILS.
2.

LIGHTING
- 2.1

MODIFY BASE BUILDING LIGHTING AS SHOWN ON DRAWING USING EXISTING JUNCTION BOXES IN CEILING SPACE. DO NOT OVERLOAD CIRCUITS.
- 2.2

BASE BUILDING LUMINAIRES UTILIZE A "MODULAR QUICK-CONNECT" TYPE HARNESS WIRING SYSTEM. PROVIDE ALL APPROPRIATE HARNESSES, SWITCHING ACCESSORIES AND ANY ADDITIONAL ATTACHMENTS NECESSARY TO MAKE SYSTEM OPERATIONAL.
- 2.3

PURCHASE ALL ADDITIONAL BASE BUILDING LUMINAIRES AND WIRING HARNESSES REQUIRED FOR THIS PROJECT FROM THE LANDLORD. IF UNABLE TO OBTAIN FROM THE LANDLORD, PURCHASE LUMINAIRES AND WIRING HARNESSES DIRECTLY FROM THE MANUFACTURER.
- 2.4

ALL LUMINAIRES INCLUDING ALL DOWNLIGHTS AND PENDANTS, EXCLUDING EMERGENCY LUMINAIRES, WITHIN THE TENANT PREMISES TO BE ON A SEPARATE LIGHTING ZONE AND TO BE CONTROLLED BY BASE BUILDING LIGHTING CONTROL SYSTEM UNLESS OTHERWISE NOTED. REARRANGE CIRCUITING OF BASE-BUILDING LUMINAIRES AT DEMISING PARTITIONS TO ENSURE LIGHTING ZONES ARE INDEPENDENT OF ADJACENT TENANCIES AND/OR COMMON AREAS. PROVIDE ALL NECESSARY RELAYS, CONTACTORS, RELAY PANELS AND ANY INTERFACE REQUIRED FOR SUCH CONTROL. CONTACT BASE BUILDING OPERATIONS TO COORDINATE LIGHTING CONTROL ZONES AND TIE-INS PRIOR TO CONSTRUCTION START.
- 2.5

EXTEND WIRING TO NEW EMERGENCY LUMINAIRES FROM EXISTING CIRCUITS AVAILABLE IN CEILING SPACE. DO NOT OVERLOAD CIRCUIT. PROVIDE NEW CIRCUITS AS NECESSARY. WHERE EXISTING EMERGENCY LIGHTING CIRCUITS ARE 347V AND EMERGENCY LIGHTING IS 120V, PROVIDE AUTO TRANSFORMERS AS REQUIRED. PLANS DENOTE FINAL LOCATION OF EMERGENCY LUMINAIRES. RECIRCUIT EXISTING NORMAL AND EMERGENCY LIGHTING CIRCUITS TO OBTAIN LAYOUT AS SHOWN.
- 2.6

CONNECT EXIT LIGHTS TO NEAREST EXIT LIGHT CIRCUIT ON THIS FLOOR. ALL EXISTING RED EXIT LIGHTS WITHIN SCOPE OF WORK TO BE REMOVED AND REPLACED. EXIT LIGHTS SHALL MATCH BASE BUILDING STANDARD COMPLETE WITH GREEN RUNNING MAN PICTOGRAM. PROVIDE NEW CIRCUITS AS NECESSARY. EXIT LIGHTS SHALL BE CERTIFIED AS PER CSA 22.2 NO.141-10, AND MEET ISO 3864-1 AND 7010.
- 2.7

WHERE EMERGENCY LIGHTS ARE CONTROLLED VIA 0-10V DIMMING, PROVIDE A 0-10V BYPASS SHUNT RELAY CERTIFIED AS PER UL924.
3.

POWER
- 3.1

CIRCUIT NUMBERS SHOWN ARE FOR GROUPING PURPOSES ONLY. RE-ARRANGE EXISTING CIRCUITS AND PROVIDE NEW BREAKERS AS REQUIRED IN EXISTING PANELS.
- 3.2

THE FURNITURE SYSTEM ON THIS PROJECT IS AN 8 WIRE, 4 CIRCUIT SYSTEM. PROVIDE 4 HOTS, 2 NEUTRAL AND 2 GROUND WIRES. PROVIDE ALL CONNECTIONS TO FURNITURE SYSTEMS AS PER FURNITURE MANUFACTURER'S RECOMMENDATIONS.
- 3.3

VERIFY EXACT POWER REQUIREMENTS OF ALL COPIER OUTLETS PRIOR TO ROUGH-IN.
4.

LIFE SAFETY SYSTEM
- 4.1

PROVIDE COST FOR ADDITION, RELOCATION, VERIFICATION AND TESTING OF ALL LIFE SAFETY SYSTEM COMPONENTS. ALL FIRE ALARM WORK, INCLUDING TIE-INS TO BASE BUILDING LIFE SAFETY SYSTEM TO BE DONE BY LANDLORD'S CONTRACTOR WITH ASSOCIATED COSTS CARRIED IN THIS CONTRACT. ALL NEW LIFE SAFETY DEVICES TO MATCH BASE BUILDING STANDARDS.
5.

VOICE/DATA
- 5.1

PROVIDE EMPTY CONDUIT C/W PULL STRING, JUNCTION BOXES AND ALL NECESSARY ACCESSORIES TO FACILITATE THE PROPER INSTALLATION OF VOICE/DATA CABLING AND DEVICES. THE SUPPLY AND INSTALLATION OF VOICE/DATA CABLING SHALL BE BY THE COMMUNICATIONS CONTRACTOR.
6.

SECURITY
- 6.1

PROVIDE 120 VOLT POWER AND EMPTY CONDUIT C/W PULL STRING, JUNCTION BOXES AND ALL NECESSARY ACCESSORIES TO FACILITATE THE PROPER INSTALLATION OF SECURITY CABLING AND DEVICES. THE SUPPLY AND INSTALLATION OF SECURITY DEVICES AND WIRING SHALL BE BY SECURITY CONTRACTOR. CONFIRM EXACT REQUIREMENTS WITH TENANT PRIOR TO COMMENCEMENT OF ANY WORK.
- 6.2

WHERE FIRE ALARM PULLSTATIONS ARE REQUIRED AT DOORS EQUIPPED WITH ELECTRO-MAGNETIC LOCKS, THE PULL STATION SHALL BE PROVIDED COMPLETE WITH DOUBLE CONTACTS. CONNECT ONE CONTACT DIRECTLY TO SECURITY MAG LOCK AND ONE CONTACT TO THE BASE BUILDING FIRE ALARM SYSTEM. WHERE PULLSTATIONS ARE SHOWN AS "EXISTING TO REMAIN", CONFIRM IF DEVICES HAVE DUAL CONTACTS AND REPLACE WITH NEW, IF REQUIRED.

### DRAWING LIST

E-001	ELECTRICAL LEGEND, GENERAL NOTES & DRAWING LIST
E-002	ELECTRICAL SPECIFICATION PAGE 1 OF 2
E-003	ELECTRICAL SPECIFICATION PAGE 2 OF 2
E-101	GROUND FLOOR - DEMOLITION PLAN
E-201	GROUND FLOOR - LIGHTING PLAN
E-301	GROUND FLOOR - POWER AND SYSTEM PLAN
E-601	ELECTRICAL DETAILS

### ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	EXISTING BASE BUILDING LUMINAIRE TO REMAIN.
	EXISTING BASE BUILDING LUMINAIRE TO BE REMOVED AND/OR RELOCATED.
	EXISTING OR NEW FLUORESCENT OR LED LUMINAIRE IN RELOCATED LOCATION. (CONTRACTOR TO SUPPLY NEW LUMINAIRES AS REQUIRED).
	LUMINAIRES ON EMERGENCY OR NIGHT LIGHT CIRCUIT.
	CEILING MOUNTED LINEAR LUMINAIRE.
	WALL MOUNTED LINEAR LUMINAIRE.
	RECESSED DOWNLIGHT LUMINAIRE.
	CEILING MOUNTED LUMINAIRE.
	WALL MOUNTED SCONCE LUMINAIRE.
<b>A, B, F1</b>	LUMINAIRE DESIGNATOR. LETTER INSIDE DENOTES LUMINAIRE TYPE. REFER TO LUMINAIRE SCHEDULE.
	EXIT LIGHT - WALL OR CEILING MOUNTED AS SHOWN. ARROW(S) DENOTE(S) ILLUMINATED FACE(S) AND DIRECTION. BAR(S) INDICATE ILLUMINATED FACE(S) ONLY.
	LIGHT SWITCH - SINGLE POLE, 120 VOLT OR 347 VOLT AS REQUIRED.
	LIGHT SWITCH COMPLETE WITH INTEGRAL OCCUPANCY SENSOR.
	DIMMING LIGHT SWITCH.
	CEILING OR WALL MOUNTED OCCUPANCY MOTION SENSOR.
	WALL MOUNTED DUPLEX RECEPTACLE (15A, 1P, 120V UNLESS OTHERWISE NOTED).
	WALL MOUNTED DUPLEX RECEPTACLE (20A 1P, 120V T-SLOT UNLESS OTHERWISE NOTED).
	WALL MOUNTED DUPLEX RECEPTACLE COMPLETE WITH TWO (2) USB CHARGERS (SINGLE (1) TYPE A AND SINGLE (1) TYPE C). RECEPTACLE SHALL BE 15A, 1P, 120V AND 2.0A, 5VDC FOR USB. HUBBELL CAT.# USB1SAC5W OR EQUAL.
	WALL MOUNTED QUAD RECEPTACLE, (15A, 1P, 120V UNLESS OTHERWISE NOTED).
	DIRECT CONNECTION OUTLET. (HARDWIRE DIRECT CONNECTION TO EQUIPMENT TERMINALS).
	SINGLE-GANG WALL MOUNTED COMBINATION VOICE/DATA OUTLET BOX.
	WIRELESS ACCESS POINT.
	HARDWIRE DIRECT CONNECTION TO EQUIPMENT. 'F' DENOTES FLOOR, 'WM' DENOTES WALL, 'C' DENOTES CEILING.
	SINGLE PHASE MOTOR CONNECTION COMPLETE WITH DISCONNECT SWITCH.
	AUTOMATIC DOOR OPERATOR PUSH BUTTON SUPPLIED BY OTHERS. PROVIDE SINGLE GANG BOX COMPLETE WITH 21mm (3/4") CONDUIT AND 4C/18AWG UP TO DOOR MOTOR.
	ELECTRIC STRIKE.
	CARD READER.
	DOOR CONTACT.
	HARDWARE DIRECT CONNECTION TO EQUIPMENT COMPLETE WITH DISCONNECT SWITCH.
	CCTV CAMERA 21mm (3/4") EC BACK TO SECURITY PLYWOOD BACKBOARD.
	CEILING OR WALL MOUNTED SECURITY MOTION DETECTOR SENSOR.
	SMOKE DETECTOR - CEILING OR WALL MOUNTED.
	REMOTE DOUBLE HEAD EMERGENCY LAMP UNIT. 'W' DENOTES WALL MOUNTED, 'C' DENOTES CEILING MOUNTED.
	WALL MOUNTED TELEVISION. CONNECTED WITH BOTH POWER AND COMMUNICATIONS.
	THERMOSTAT.
	EMERGENCY BATTERY UNIT/REMOTE C/W UNIT MOUNTED DOUBLE HEAD. ABB LUMICELL CAT# RGC272BLD.
<b>ADDITIONAL NOMENCLATURE</b>	
<b>GENERAL</b>	
E	EXISTING TO REMAIN
R	EXISTING TO BE REMOVED AND/OR RELOCATED
ER	EXISTING IN RELOCATED POSITION
R/R	REMOVE AND REINSTALL
R/ER	REMOVE AND REINSTALL IN REVISED LOCATION
JB	JUNCTION BOX
AFF	ABOVE FINISHED FLOOR
WP	WEATHER-PROOF
GFI	GROUND FAULT INTERRUPTER
TL	TWIST LOCK

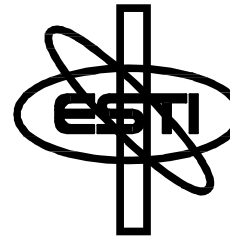
# RED

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NO.	DESCRIPTION	DATE
1	ISSUED FOR COORDINATION	2025-02-03
2	ISSUED FOR PERMIT	2025-02-10
3	ISSUED FOR TENDER	2025-04-17



#### PROJECT INFORMATION

KELSO ARRIVAL CENTRE  
5234 KELSO ROAD  
MILTON, ON L9E 0C6

#### DRAWING TITLE

ELECTRICAL LEGEND, GENERAL  
NOTES AND DRAWING LIST

PROJECT NO.: 241278  
DATE: 2025-04-17  
SCALE: N.T.S.

DRAWN BY: MS  
REVIEWED BY: BF

DRAWING NO.

## E-001



## ELECTRICAL SPECIFICATIONS

### GENERAL ELECTRICAL REQUIREMENTS

#### 1. CODES & STANDARDS

1.1. COMPLETE THE INSTALLATION OF THE WORK IN ACCORDANCE WITH THE LATEST EDITIONS OF THE ONTARIO BUILDING CODE, ONTARIO ELECTRICAL SAFETY CODE, C.S.A. STANDARDS, U.L.C., N.F.P.A., O.H.S.A. AND OTHER CODES, AS REQUIRED. COMPLY WITH ELECTRICAL AND BUILDING CODE BULLETINS IN FORCE AT TIME OF BID SUBMISSION. WHILE NOT IDENTIFIED AND SPECIFIED BY NUMBER IN THIS DIVISION, THEY ARE TO BE CONSIDERED AS FORMING PART OF RELATED STANDARDS. ALSO, ALL ELECTRICAL WORK SHALL COMPLY WITH LANDLORD'S REQUIREMENTS AND BASE BUILDING STANDARDS. CONTRACTOR SHALL OBTAIN ALL LANDLORD'S REQUIREMENTS AND BASE BUILDING STANDARDS FROM THE LANDLORD DURING THE TENDER PERIOD.

#### 2. EXISTING CONDITIONS

2.1. VISIT THE SITE AND EXAMINE THE EXISTING CONDITIONS AFFECTING THE WORK OF THIS DIVISION. NO CLAIM FOR EXTRA PAYMENT SHALL BE MADE FOR EXTRA WORK MADE NECESSARY BY CIRCUMSTANCES ENCOUNTERED DUE TO CONDITIONS WHICH WERE VISIBLE UPON, OR REASONABLY INFERRABLE FROM AN EXAMINATION OF THE SITE PRIOR TO SUBMISSION OF THE BID. THIS INCLUDES THE EXISTING SERVICES ABOVE CEILING.

2.2. BE AWARE THAT THERE MAY BE ASBESTOS FIBRES PRESENT IN VARIOUS FINISHES OR ON VARIOUS SURFACES. IN CERTAIN AREAS OF THE BUILDING, ARRANGE WORK SO AS NOT TO DISRUPT THESE MATERIALS, OR TAKE FULL AND NECESSARY MEANS TO PROTECT ALL PERSONNEL FROM CONTACT WITH THEM, IN A WAY TO BE APPROVED BY THE LANDLORD. INCLUDE ALL COSTS ASSOCIATED WITH ANY REMEDIAL WORK, IN THE BID.

#### 3. DEFINITIONS

3.1. WHEREVER THE WORDS "PROVIDE" OR "SUPPLY AND INSTALL," ARE USED, IT SHALL BE UNDERSTOOD TO MEAN "PROVIDE AND INSTALL, INCLUSIVE OF ALL LABOUR, MATERIALS, INSTALLATION, TESTING, AND CONNECTIONS" FOR THE ITEM TO WHICH IT REFERENCES.

3.2. WHEREVER THE WORDS "EQUAL," "APPROVED," OR "APPROVED EQUAL" ARE USED, IT SHALL BE UNDERSTOOD TO MEAN "EQUAL," "APPROVED," OR "APPROVED EQUAL" IN THE OPINION OF THE CONSULTANT ONLY.

#### 4. MATERIALS AND EQUIPMENT

4.1. ALL MATERIALS AND EQUIPMENT SHALL BE NEW, CERTIFIED AS PER C.S.A./U.L.C. OR AS APPROVED BY THE O.E.S.C. AND MANUFACTURED TO THE STANDARDS SPECIFIED.

4.2. WHERE THERE IS NO ALTERNATIVE TO SUPPLYING EQUIPMENT WHICH IS NOT CERTIFIED AS PER C.S.A./U.L.C. OR AS APPROVED BY THE O.E.S.C., OBTAIN SPECIAL APPROVAL FROM THE ELECTRICAL SAFETY AUTHORITY.

#### 5. PERMITS AND FEES

5.1. THE ELECTRICAL CONTRACTOR SHALL ACT AS THE OWNER'S AGENT IN ACCORDANCE WITH SECTION 2 OF THE O.E.S.C. AND SHALL IMMEDIATELY UPON AWARD OF CONTRACT, SUBMIT TO THE LOCAL ELECTRICAL INSPECTION DEPARTMENT, THE NECESSARY NUMBER OF DOCUMENTS FOR EXAMINATION, SPECIAL INSPECTION AND APPROVAL, PRIOR TO THE COMMENCEMENT OF THE WORK, AND PAY ALL COSTS AND ASSOCIATED FEES, IF REQUIRED, PREPARE ANY ADDITIONAL DRAWINGS/DOCUMENTS REQUIRED BY THE AUTHORITY.

5.2. THE CONSULTANT WILL PROVIDE UPON REQUEST, AT THE CONTRACTOR'S COST, THE REQUIRED QUANTITY OF DRAWINGS.

5.3. PROVIDE CERTIFICATE(S) OF ACCEPTANCE FROM THE AUTHORITIES INSPECTION DEPARTMENT, UPON COMPLETION OF WORK.

#### 6. INSURANCE

6.1. PROVIDE AND MAINTAIN INSURANCE TO PROTECT THE LANDLORD, TENANT AND TRADES FROM ALL POSSIBLE CLAIMS. SUBMIT WITH BID FOR AN AMOUNT ACCEPTABLE TO LANDLORD AND TENANT.

#### 7. CONTRACT DOCUMENTS

7.1. THE DRAWINGS FOR THE ELECTRICAL WORK ARE DIAGRAMMATIC PERFORMANCE DRAWINGS ONLY. INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT, SIZE AND LOCATION OF ELECTRICAL EQUIPMENT. THE DRAWINGS DO NOT INTEND TO SHOW ARCHITECTURAL, INTERIOR DESIGN, MECHANICAL, STRUCTURAL OR BASE BUILDING DETAILS. BE RESPONSIBLE FOR A THOROUGH KNOWLEDGE OF SAME BEFORE PROCEEDING WITH THE WORK.

7.2. DO NOT SCALE OR MEASURE DRAWINGS, BUT OBTAIN INFORMATION REGARDING ACCURATE DIMENSIONS FROM THE DIMENSIONS SHOWN ON THE DESIGN CONSULTANT'S/ARCHITECT'S DRAWINGS, OR BY SITE REQUIREMENTS.

7.3. ANY DISCREPANCIES BETWEEN DRAWINGS AND/OR SPECIFICATIONS AND EXISTING CONDITIONS, MUST BE REFERRED TO THE DESIGN CONSULTANT/ARCHITECT BEFORE ANY WORK AFFECTED IS BEGUN.

7.4. COOPERATE AND COORDINATE WITH OTHER CONTRACTORS IN LAYING OUT OF WORK SO AS NOT TO CONFLICT WITH THE WORK OF OTHER CONTRACTORS. CARRY OUT WORK PROMPTLY AS PER CONSTRUCTION SCHEDULE AND COORDINATE WITH WORK OF OTHER CONTRACTOR

7.5. MAKE, AT NO ADDITIONAL COST, ANY CHANGES OR ADDITIONS TO MATERIALS AND EQUIPMENT NECESSARY TO ACCOMMODATE STRUCTURAL CONDITIONS (OFFSETS AROUND BEAMS, COLUMN, ETC.)

#### 8. INTENT

8.1. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS THAT THE CONTRACTOR PROVIDE COMPLETE AND OPERATIONAL SYSTEMS AS REQUIRED, WHERE DIFFERENCES OCCUR, THE MAXIMUM CONDITION SHALL GOVERN.

8.2. ANY MISCELLANEOUS ITEMS, HARDWARE, DEVICES, WIRING, ETC., NOT SPECIFICALLY DESCRIBED, BUT REQUIRED FOR THE OPERATION OF THE SYSTEM, MUST BE PROVIDED AND INCLUDED AS PART OF THE BID.

#### 9. SHOP DRAWINGS

9.1. SUBMIT SINGLE (1) SET OF SHOP DRAWINGS IN EITHER PDF OR HARD COPY FORMAT FOR ALL SPECIFIED EQUIPMENT FOR REVIEW AND RECORDS BEFORE COMMENCEMENT OF WORK.

9.2. CHANGES MADE TO THE SHOP DRAWINGS BY THE CONSULTANT WILL NOT AFFECT THE CONTRACT PRICE.

#### 10. INSERTS, HANGERS AND SLEEVES

10.1. PROVIDE HANGERS, INSERTS, SLEEVES AND SUPPORTS AS REQUIRED.

10.2. INSERTS ARE TO BE OF A LEAD SHIELD TYPE.

10.3. HANGERS MUST NOT BE WELDED TO STRUCTURAL STEEL MEMBERS AND BURNING OF HOLES IN STRUCTURAL STEEL IS PROHIBITED.

10.4. SLEEVES ARE TO BE OF A TYPE SUITABLE FOR THE APPLICATION AND BE SEALED AND MADE WATERTIGHT. SLEEVES THROUGH CONCRETE SHALL BE SCHEDULE 40 STEEL PIPE, SIZED FOR FREE PASSAGE OF CONDUIT AND INSTALLED FLUSH WITH UNDERSIDE OF CONCRETE SLAB AND EXTEND 103MM (4") ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.

10.5. DO NOT USE ANY BASE BUILDING SUPPORTS OR EQUIPMENT, INCLUDING CEILING SUPPORT SYSTEM.

#### 11. CUTTING AND PATCHING

11.1. ALL CUTTING AND PATCHING REQUIRED TO THE EXISTING BUILDING STRUCTURE FOR THE WORK SHALL BE INCLUDED UNDER THIS CONTRACT AND BE ACCEPTABLE TO THE LANDLORD. OBTAIN WRITTEN APPROVAL FROM LANDLORD BEFORE ANY CUTTING IS CARRIED OUT.

11.2. WHERE CONDUITS PASS THROUGH FIRE RATED WALLS OR FLOORS, PROVIDE FIRE STOPPING MATERIAL LISTED WITH, AND BEAR LABEL OF CSA AND U.L.C. AND MAINTAIN SAME FIRE RATING OF BUILDING COMPONENT PENETRATION.

#### 12. LOCATION OF OUTLETS

12.1. REFER TO DESIGN CONSULTANT'S/ARCHITECT'S DRAWINGS FOR EXACT LOCATIONS OF ALL LIGHTING FIXTURES AND WIRING DEVICES.

12.2. CHANGE LOCATION OF OUTLETS AT NO COST OR CREDIT, PROVIDING DISTANCE DOES NOT EXCEED 3M (10'-0") AND INFORMATION IS GIVEN PRIOR TO INSTALLATION.

12.3. ALL OUTLETS TO BE MARKED ON JOB SITE FOR APPROVAL BY DESIGN CONSULTANT/ARCHITECT PRIOR TO INSTALLATION.

#### 13. PLYWOOD

13.1. ALL SURFACE MOUNTED ELECTRICAL DISTRIBUTION EQUIPMENT SHALL BE MOUNTED ON PLYWOOD BACKBOARDS. PROVIDE ALL PLYWOOD BACKBOARDS REQUIRED FOR THE WORK OF THIS DIVISION. PLYWOOD BACKBOARDS SHALL BE 21MM (3/4") THICK, OF HIGHEST QUALITY FIRE RETARDANT FIR, PRIME AND PAINT BACKBOARDS WITH FIRE RETARDANT PAINT EQUAL TO CGSB SPEC. #1-GP-151M, OF A COLOUR AS SELECTED BY THE DESIGN CONSULTANT/ARCHITECT.

#### 14. ACCESS DOORS

14.1. WHEREVER ANY BASE BUILDING EQUIPMENT REQUIRES ACCESSIBILITY, MAINTENANCE OR ADJUSTMENT, PROVIDE ACCESS DOORS APPROVED BY DESIGN CONSULTANT/ARCHITECT AND LANDLORD. ARRANGE FOR ITS INSTALLATION BY THE DIVISION IN WHOSE WORK IT OCCURS.

#### 15. CORE DRILLING

15.1. BEFORE CORE DRILLING FLOOR SLAB OR STRUCTURAL WALLS, X-RAY SLAB OR WALLS AND HAVE THE LOCATIONS ACCEPTED BY THE LANDLORD IN WRITING.

15.2. ANY EXISTING BUILDING SERVICE DAMAGED BY CORE DRILLING MUST BE REPAIRED IMMEDIATELY AT NO COST TO LANDLORD OR TENANT.

15.3. FLOOR DRILLING TO BE CARRIED OUT AFTER NORMAL WORKING HOURS AND AT A TIME ACCEPTABLE TO LANDLORD AND ALLOWANCES FOR THIS WORK SHALL BE INCLUDED IN BID PRICE SUBMITTED.

#### 16. NOISE AND VIBRATION

16.1. ELECTRICAL EQUIPMENT IS TO OPERATE WITHOUT OBJECTIONABLE NOISE OR VIBRATION. IF, IN THE OPINION OF THE CONSULTANT, THE EQUIPMENT OPERATES WITH EXCESSIVE NOISE OR VIBRATION, THEN THE EQUIPMENT MUST BE REPLACED OR NOISE OR VIBRATION ELIMINATED.

16.2. CONNECTIONS TO NOISE-PRODUCING AND VIBRATING EQUIPMENT MUST BE MADE WITH LIQUID-TIGHT FLEXIBLE CONDUIT AND ASSOCIATED CONNECTORS. THIS INCLUDES TRANSFORMERS, DIMMING EQUIPMENT RACKS, AND MOTORS. USE A MINIMUM OF 1M (3FT) OF FLEXIBLE CABLE WITH SLACK AT EACH DEVICE.

16.3. VIBRATION ISOLATORS ARE TO BE PROVIDED WHERE INDICATED OR REQUIRED. TRANSFORMERS TO BE ISOLATED FROM THE STRUCTURE, WITH SPRING AND RUBBER ISOLATORS WHEN WALL MOUNTED OR SUSPENDED AND 12MM (1/2") HIGH DENSITY NEOPRENE SANDWICH PADS (TYPE MWP) WHEN FLOOR MOUNTED.

#### 17. TENANT'S EQUIPMENT

17.1. WHERE SPECIFIED, INSTALL ALL EQUIPMENT PROVIDED BY THE TENANT. RECEIVE, STORE AND INSTALL EQUIPMENT AND ACCEPT FULL RESPONSIBILITY FOR ITS CORRECT OPERATION. PROVIDE CONDUIT, WIRE, BOXES, SWITCHES, OUTLETS, DEVICES, FLEX CONNECTIONS, ETC., AS REQUIRED.

#### 18. WORK IN NEW AND RENOVATED AREAS

18.1. WHEN DELETING AND/OR MAKING SAFE EXISTING ELECTRICAL WORK, ENSURE THAT IT INCLUDES REMOVAL OF ALL DISCONNECTED WIRING BACK TO THE ASSOCIATED PANEL BOARD OR DISTRIBUTION EQUIPMENT.

18.2. DISCONNECT AND REMOVE EXISTING LUMINAIRES, DEVICES, OUTLETS, ETC., WHICH ARE NOT TO BE REUSED. SUCH ITEMS SHALL BE CARTONED AND TURNED OVER TO THE LANDLORD AT A PLACE DESIGNATED BY THE LANDLORD, CUT BACK AND CAP UNUSED RACEWAY AND OUTLETS AND REMOVE UNUSED WIRING BACK TO PANELBOARD IN AN APPROVED MANNER. REMOVE ALL REDUNDANT COMMUNICATIONS CABLES BACK TO HUB ROOMS AND/OR TELEPHONE RISING ROOMS.

18.3. ENSURE THAT ALL EXISTING EQUIPMENT WHICH IS TO BE REUSED AND/OR RELOCATED IS THOROUGHLY INSPECTED AND REFURBISHED TO ENSURE CORRECT OPERATION WHEN PUT BACK INTO SERVICE AND MEETS THE LOCAL ELECTRICAL SAFETY AUTHORITY'S APPROVAL. OUTLET BOXES AND WIRING AND/OR CONDUITS WHICH ARE CORRODED OR DAMAGED ARE TO BE REPLACED.

18.4. ALL EXISTING ELECTRICAL EQUIPMENT WHICH IS NO LONGER REQUIRED SHALL BE REMOVED AND DISPOSED OF, OFF SITE.

18.5. WHERE EXISTING OUTLET BOXES ARE REMOVED FROM EXISTING UNDER FLOOR DUCTS, PLUG AND CAP EXISTING HOLES FLUSH WITH FLOOR USING APPROVED FITTINGS. REMOVE ALL REDUNDANT WIRE AND CABLE BACK TO SERVICE.

18.6. BE RESPONSIBLE AND PAY FOR ANY DAMAGE TO THE BASE BUILDING INCURRED BY WORK OF THIS DIVISION, OR REPAIR TO THE SATISFACTION OF THE CONSULTANT.

18.7. CARRY OUT THE WORK WITH A MINIMUM OF NOISE, DUST AND DISTURBANCE.

18.8. PROVIDE TOOLS AND CLEAN UP EQUIPMENT. OBTAIN THE LANDLORD'S PERMISSION FOR THE USE OF ELECTRICAL, ELEVATOR, PLUMBING OR DRAINAGE OUTLETS.

18.9. PROVIDE DAILY CLEAN UP AND PROPER DISPOSAL OF DEBRIS GENERATED BY DAILY OPERATIONS. ON COMPLETION OF THE WORK, ALL TOOLS, SURPLUS MATERIALS AND WASTE MATERIALS SHALL BE REMOVED AND THE PREMISES LEFT IN A CLEAN AND PERFECT CONDITION.

18.10. REMOVE AND REROUTE EXISTING CONDUITS WHICH ARE TO REMAIN IN "FINISHED" AREAS WHICH ARE TO BE EXPOSED.

18.11. CONDUITS WHICH ARE TO BE CUT BACK ARE TO TERMINATE IN A JUNCTION BOX.

18.12. CLEAN LUMINAIRE REFLECTORS AND LENSES, LAMPS, AND OTHER SURFACES THAT HAVE BEEN EXPOSED TO CONSTRUCTION DUST AND DIRT. CLEAN THE INSIDES AND OUTSIDES OF PANELBOARDS, SPLITTERS AND OTHER ELECTRICAL EQUIPMENT, AND COMPLETELY REMOVE ALL DEBRIS AND TOOLS FROM THE PROJECT.

#### 19. INTERRUPTION OF SERVICES

19.1. INTERRUPTION OF ELECTRICAL SERVICE TO ANY PART OF THE BUILDING SHALL OCCUR ONLY BY PRE-ARRANGEMENT WITH AND AT TIMES SUITABLE TO THE LANDLORD.

19.2. INTERRUPTIONS SHALL ONLY OCCUR DURING PREMIUM TIME PERIODS; ALL ALLOWANCES FOR THIS SHALL BE INCLUDED IN THE PRICE SUBMITTED.

#### 20. IDENTIFICATION

20.1. PROVIDE LAMACOID NAMEPLATES ON ALL PANELS, DISCONNECT SWITCHES, SPLITTERS, ETC., TO MATCH BASE BUILDING. LAMACOIDS SHALL IDENTIFY EQUIPMENT DESIGNATION, VOLTAGE, PHASE, NUMBER OF WIRES AND LOCATION OF FEED. NAMEPLATES SHALL BE MECHANICALLY ATTACHED TO EQUIPMENT BY MEANS OF RIVETS OR SELF TAPPING SCREWS. LAMACOIDS SHALL BE ATTACHED PRIOR TO EQUIPMENT BEING ENERGIZED.

20.2. PROVIDE TYPEWRITTEN DIRECTORIES FOR NEW AND EXISTING PANELS. CONFIRM EXISTING IDENTIFICATION AND CORRECT WHERE NECESSARY.

20.3. CLEARLY MARK ALL EXPOSED CONDUIT, PULLBOXES, JUNCTION BOXES, ETC., TO INDICATE THE NATURE OF THE SERVICE TO MATCH BASE BUILDING STANDARDS.

20.4. ALL RECEPTACLES TO BE LABELED COMPLETE WITH CIRCUIT NUMBER AND PANEL DESIGNATION WITH SELF-LAMINATING VINYL LABELS.

#### 21. VALUATION OF CHANGES

21.1. PROVIDE COMPLETE BREAKDOWN OF MATERIAL, LABOUR, OVERHEAD, PROFIT, ETC., WHEN SUBMITTING QUOTATIONS FOR CHANGE NOTICES ON THIS PROJECT.

21.2. THE HOURLY LABOUR RATE SHALL BE INCLUSIVE OF ALL CHARGES FOR SUPERVISION, VARIABLE LABOUR FACTORS, HAND TOOLS, PAYROLL BURDENS, HEIGHT FACTORS, WARRANTIES, STORAGE, RENTALS, ADDITIONAL BONDING, PARKING, CLEAN-UP, RECORD DRAWINGS, HOISTING, FREIGHT AND DELIVERY, BUT EXCLUSIVE OF OVERHEAD AND PROFIT.

21.3. THE LABOUR HOURS SHALL BE BASED ON THE LATEST ISSUE OF THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA) LABOUR UNITS, COLUMN ONE NORMAL FOR THE DURATION OF THIS CONTRACT.

21.4. THE MATERIAL PRICES SHALL BE BASED ON THE CURRENT NATIONAL PRICES SYSTEM (NPS) CATALOGUE LESS APPLICABLE TRADE DISCOUNTS.

#### 22. ENGINEERS FINAL INSPECTION

22.1. FINAL INSPECTION IS IMPERATIVE. PRIOR TO CLOSING OF CEILINGS, THIS CONTRACTOR SHALL CONTACT MULVEY & BANANI INC. (416) 751-2520 AND THE LANDLORD'S REPRESENTATIVE TO PERFORM A FINAL INSPECTION WHEN CEILING TILES HAVE BEEN INSTALLED IT WILL BE NECESSARY FOR THE CONTRACTOR TO REMOVE PORTIONS FOR INSPECTION.

#### 23. COMPLETION OF CONTRACT

23.1. ALL EQUIPMENT MUST BE CLEANED AND TESTED BEFORE FINAL ACCEPTANCE BY CONSULTANT.

23.2. FROM THE DATE OF ISSUANCE OF A "CERTIFICATE OF SUBSTANTIAL PERFORMANCE", PROVIDE A WRITTEN GUARANTEE FOR ONE YEAR COVERING ALL EQUIPMENT, MATERIALS AND WORKMANSHIP, OTHER THAN LAMPS. INSERT IN OPERATIONS AND MAINTENANCE MANUAL.

23.3. DEFECTS AND DEFICIENCIES WHICH ORIGINATE OR BECOME EVIDENT DURING THE WARRANTY PERIOD MUST BE REPAIRED OR REPLACED, AT NO COST.

23.4. REPLACE, AT NO COST, ALL INCANDESCENT LAMPS BURNED-OUT DURING A THIRTY (30) DAY PERIOD AND ALL BURNED-OUT FLUORESCENT AND HID LAMPS FOR A PERIOD OF NINETY (90) DAYS AFTER DATE OF ISSUANCE OF CERTIFICATE OF "SUBSTANTIAL PERFORMANCE" FOR THE CONTRACT FOR THE WORK. PROVIDE ONE YEAR WARRANTY FOR ALL LED TYPE LUMINAIRES AND/OR LAMPS.

23.5. IF, DURING THE WARRANTY PERIOD, TRANSFORMERS, BALLASTS OR OTHER NOISE AND VIBRATION PRODUCING EQUIPMENT ARE CONSIDERED BY THE CONSULTANT TO EXCEED ACCEPTABLE STANDARDS, THEN THESE MUST BE REPLACED WITHOUT DELAY OR ADDITIONAL COST TO THE TENANT. ALL WORK RELATING TO THE REPLACEMENT OF DEFECTIVE ITEMS, MUST BE CARRIED OUT AFTER NORMAL WORKING HOURS AND AT A TIME WHICH IS ACCEPTABLE TO THE TENANT.

#### 24. RECORD DRAWINGS

24.1. AT THE COMPLETION OF WORK AND BEFORE FINAL ACCEPTANCE, PROVIDE RECORD DRAWINGS OF THE INSTALLATION IN AUTOCAD 2010 OR NEWER. AN ELECTRONIC COPY (AUTOCAD FORMAT) OF ALL DRAWINGS WILL BE PROVIDED TO THE ELECTRICAL CONTRACTOR BY THE CONSULTANT AT NO COST. THE DRAWINGS WILL REFLECT THE TENDER AND/OR CONSTRUCTION SET OF DRAWINGS. SHOULD THE CONTRACTOR REQUIRE ADDITIONAL ELECTRONIC COPIES DURING CONSTRUCTION, THEY CAN BE PURCHASED FROM THE CONSULTANT AT THE FOLLOWING COSTS:

- \$50.00 PER DRAWING FOR THE FIRST 10 DRAWINGS
- \$30.00 PER DRAWING FOR ADDITIONAL DRAWINGS 11 THROUGH 20
- \$750.00 FOR 20 DRAWINGS OR MORE

24.1. INCORPORATE ALL CHANGES AND DEVIATIONS FROM TENDER DRAWINGS, UTILIZING NORMAL RECOGNIZED DRAFTING PROCEDURES THAT MATCH THE ORIGINAL DRAFTING METHODOLOGY.

24.2. ALL MAIN BRANCH CONDUIT RUNS, JUNCTION BOX LOCATIONS, CONDUIT RUNS FOR ALL FLOOR OUTLETS, ETC., MUST BE REFLECTED ON THE DRAWINGS.

24.3. REMOVE THE ELECTRICAL ENGINEERS STAMP FROM ALL RECORD DRAWINGS.

24.4. ENSURE THE MULVEY AND BANANI LOGO REMAINS ON ALL RECORD DRAWINGS.

24.5. CLEARLY INDICATE THE WORDS "RECORD DRAWINGS" IN THE TITLE BLOCK COLUMN OF THE DRAWINGS AS WELL AS THE ELECTRICAL CONTRACTOR'S NAME AND ADDRESS.

24.6. SUBMIT A SINGLE (1) SET OF CAD AND PDF DRAWINGS TO CONSULTANT FOR REVIEW. WHEN FOUND ACCEPTABLE BY THE CONSULTANT, SUBMIT THREE (3) SETS OF PRINTS TOGETHER WITH THE CAD DISK FOR PRESENTATION TO THE LANDLORD AND TENANT.

#### 25. OPERATION AND MAINTENANCE MANUALS

25.1. PROVIDE 2 (TWO) SETS OF OPERATION AND MAINTENANCE MANUALS SUBMITTED IN HARD COVER 3-RING BINDERS. INCLUDE THE FOLLOWING INFORMATION IN THE OPERATIONS AND MAINTENANCE MANUALS:

- 25.1.1. NAMES AND ADDRESS OF LOCAL SUPPLIERS FOR THE ITEMS INCLUDED.
- 25.1.2. TECHNICAL DATA, PRODUCT DATA, SUPPLEMENTED BY BULLETINS, COMPONENT ILLUSTRATIONS, EXPLODED VIEWS, TECHNICAL DESCRIPTIONS OF ITEMS, AND PARTS LISTS. ADVERTISING OR SALES LITERATURE IS NOT ACCEPTABLE.
- 25.1.3. THE CONSULTANT'S REVIEWED SHOP DRAWINGS.
- 25.1.4. CERTIFICATE(S) OF ACCEPTANCE FROM THE AUTHORITIES INSPECTION DEPARTMENT.
- 25.1.5. VERIFICATION REPORTS AND CERTIFICATE(S) FOR ANY NEW FIRE ALARM COMPONENTS TIE-INS AND ANY BASE BUILDING TIE-INS FOR MISCELLANEOUS SYSTEMS (I.E. SECURITY, LIGHTING CONTROL, DIGITAL METERING).
- 25.1.6. LOAD BALANCE REPORT.
- 25.1.7. WRITTEN GUARANTEE.
- 25.1.8. LIST OF EACH FIXTURE TYPE IDENTIFYING TYPE OF LAMP, WATTAGE AND MANUFACTURER'S CONTACT INFO.
- 25.1.9. COORDINATION STUDY.
- 25.1.10. ALL 3RD PARTY COMMISSIONING REPORTS FOR FIRE ALARM, EMERGENCY LIGHTING, EXIT LIGHTING AND OTHER LIFE SAFETY SYSTEMS.
- 25.1.11. CONTRACTOR'S INSTALLATION LETTER FOR FIRE ALARM, EMERGENCY LIGHTING, AND EXIT LIGHTING SYSTEMS.

25.2. REVIEW INFORMATION PROVIDED IN THE MAINTENANCE INSTRUCTIONS AND MANUALS WITH THE TENANTS' OPERATING PERSONNEL AND LANDLORD'S OPERATING PERSONNEL, WHERE BASE BUILDING SYSTEMS ARE REVISED, TO ENSURE A COMPLETE UNDERSTANDING OF THE ELECTRICAL EQUIPMENT AND SYSTEMS AND THEIR OPERATION.

#### 26. DEMOLITION

26.1. VISIT THE SITE, EXAMINE THE EXISTING CONDITIONS AND BECOME FAMILIAR WITH THE EXTENT OF THE NECESSARY REMOVAL, RELOCATION, RECONNECTING, AND REROUTING OF ELECTRICAL EQUIPMENT AND WIRING AS NECESSARY FOR THE COMPLETION OF THE PROJECT.

26.2. REVIEW AND CONFIRM WITH THE ARCHITECT/DESIGNER'S DRAWINGS FOR THE COMPLETE EXTENT OF DEMOLITION AND ALTERATION.

26.3. MAKE SAFE AND DISCONNECT ALL POWER AND SYSTEMS, AS AND WHEN, AND TO THE EXTENT REQUIRED TO FACILITATE WITH THE DEMOLITION.

26.4. ENSURE THAT ALL ELECTRICAL, LIFE SAFETY SERVICES, AND SERVICES FOR EXISTING EQUIPMENT, IN AREAS OUTSIDE THE AREAS OF THIS WORK, THAT ARE REQUIRED TO REMAIN IN SERVICE, SHALL DO SO.

26.5. RELOCATE ANY ELECTRICAL FEEDERS OR EQUIPMENT THAT ARE REQUIRED TO REMAIN IN SERVICE, THAT ARE SECURED TO EXISTING WALLS, FLOORS OR CEILINGS TO BE DEMOLISHED OR THAT ARE BURIED AND REQUIRED TO BE EXCAVATED FOR NEW WORK.

26.6. REMOVE AND REPLACE ANY ELECTRICAL EQUIPMENT ON WALLS OR CEILINGS THAT WILL BE DEMOLISHED AND/OR REBUILT.

26.7. WHEN DELETING AND/OR MAKING SAFE EXISTING ELECTRICAL WORK, ENSURE THAT IT INCLUDES ALL CONDUIT AND WIRING BACK TO THE ASSOCIATED PANELBOARDS OR CONTROL PANELS. WHERE FLOORBOXES ARE BEING REMOVED, ENSURE UNDER-FLOOR CONDUIT IS REMOVED BACK TO SOURCE AND FILL ALL CORE HOLES, IN FLOORS AND IN WALLS, WITH APPROPRIATE CONCRETE.

26.8. INCLUDE IN DEMOLITION WORK FOR REMOVAL OF ALL COMMUNICATION DEVICES, OUTLETS, CABLES, CONDUITS ETC, WHICH ARE NOT TO BE REUSED. ALL REDUNDANT CABLEING AND CONDUIT SHALL BE REMOVED IN ITS ENTIRETY FROM TENANT SPACE BACK TO BASE BUILDING RISER ROOMS. REMOVE ALL UNNECESSARY CABLES AND EQUIPMENT IN HUB ROOMS AND/OR TELEPHONE ROOMS WITH EXTREME CARE TO AVOID ANY ACCIDENTAL SHUTDOWN TO EXISTING SERVICES SERVING OTHER PARTS OF THE BUILDING.

26.9. PROVIDE BLANK COVERPLATE WHERE OUTLETS ARE REMOVED FROM EXISTING WALLS TO REMAIN.

26.10. ALL EXISTING ELECTRICAL EQUIPMENT WHICH IS NO LONGER REQUIRED SHALL BE REMOVED AND DISPOSED OF, OFF SITE.

26.11. BE RESPONSIBLE AND PAY FOR ANY DAMAGE TO THE BASE BUILDING INCURRED BY WORK OF THIS DIVISION, OR REPAIR TO THE SATISFACTION OF THE CONSULTANT.

26.12. CARRY OUT THE WORK WITH MINIMUM OF NOISE, DUST AND DISTURBANCE.

26.13. INCLUDE IN DEMOLITION WORK REMOVAL OF ALL EXISTING SOUND MASKING EQUIPMENT AND ASSOCIATED CABLEING & DEVICES BACK TO SOURCE.

#### 27. FIRE ALARM

#### 27.1. INITIATING AND SIGNALLING DEVICES

27.1.1. ALL PULL-STATIONS, EVAC SPEAKERS AND SMOKE DETECTORS TO MATCH EXISTING BASE BUILDING DEVICES.

27.1.2. ALL SMOKE DAMPERS SHALL BE CONNECTED TO THE NEAREST AVAILABLE 120V LIFE SAFETY EMERGENCY CIRCUIT. THE DEVICE INTO FIRE ALARM SYSTEM. PROVIDE ALL REQUIRED END SWITCHES AND ACCESSORIES FOR APPROPRIATE MONITORING AND CONTROL. COORDINATE ALL WORK WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

27.1.3. FIRE ALARM PULL STATIONS SHALL BE MOUNTED BETWEEN AT 1200mm TO TOP OF DEVICE ABOVE FINISHED FLOOR AND MAXIMUM 600mm FROM DOOR LATCH, WHERE FIRE ALARM PULL STATIONS ARE BEING REMOVED AND RELOCATED, ENSURE THAT THEY ARE REINSTALLED AS PER THE ABOVE NOTED DIMENSIONS.

27.1.4. ELECTRICAL CONTRACTOR SHALL PROVIDE TIE-IN TO BASE BUILDING MAGLOCK RISER ON EACH FLOOR TO ENSURE THAT ALL MAGLOCKS DROP IN THE EVENT OF A FIRE ALARM. MAGLOCKS SHALL ALSO RECESS WITH MAGLOCK KEYSWITCH OVERRIDE. COORDINATE INSTALLATION WITH BASE BUILDING FIRE ALARM CONTRACTOR AND PROVIDE ALL NECESSARY COMPONENTS FOR A COMPLETE INSTALLATION. WHERE EXISTING MAGLOCK RELEASE/RESET RELAYS ARE LOCATED IN THE FIELD THEY SHALL BE REMOVED AND RELOCATED INTO NEAREST DGP PANEL. EXTEND NEW CONDUIT AND WIRING BACK TO MAGLOCK POWER SUPPLY.

27.1.5. ELECTRICAL CONTRACTOR SHALL INCLUDE FOR A QUALIFIED REPRESENTATIVE TO ATTEND THE FIRE ALARM AUDIBILITY TESTING IN ORDER TO ADJUST THE FIRE ALARM ANNUNCIATION DEVICE TAP SETTINGS AS REQUIRED TO ACHIEVE THE MINIMUM/MAXIMUM AUDIBILITY REQUIREMENTS AS OUTLINED IN THE O.B.C. INCLUDE COSTS FOR ANY NECESSARY RE-VERIFICATION.

27.1.6. UPON COMPLETION OF FIRE ALARM AUDIBILITY TESTING, THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE ELECTRICAL CONSULTANT A DRAWING OUTLINING AUDIBILITY RESULTS THROUGHOUT THE RENOVATED AREAS. INCLUDE FOR A RE-VISIT TO SITE TO ALLOW FOR ADJUSTMENTS TO ANNUNCIATION DEVICE TAP SETTINGS AS DIRECTED BY THE ELECTRICAL CONSULTANT. INCLUDE FOR ANY AND ALL RE-VERIFICATION COSTS. ELECTRICAL CONTRACTOR SHALL INCLUDE ALL ANNUNCIATION DEVICE TAP SETTINGS ON RECORD DRAWINGS.

27.1.7. PROVIDE SIGNAL FROM THE BASE BUILDING FIRE ALARM SYSTEM TO THE TENANT'S AUDIO-VISUAL RACK TO SHUT-DOWN MUSIC PLAYBACK DURING ANY FIRE ALARM CONDITION IN THE BUILDING.

27.1.8. ENSURE THAT ALL FIRE ALARM JUNCTION ACCESS ENCLOSURES ARE CLEARLY LABELLED AS "FIRE ALARM".

#### 27.2. VISUAL OUTPUT DEVICES

27.2.1. SYSTEM CONNECTIONS FOR INITIATING AND SIGNALING LINE CIRCUITS SHALL BE CLASS "A" AND NOTIFICATION APPLIANCE CIRCUITS SHALL ALSO BE CLASS "A".

27.2.2. CIRCUIT SUPERVISION: CIRCUIT FAULTS SHALL BE INDICATED BY A TROUBLE SIGNAL AT THE FACP. PROVIDE A DISTINCTIVE INDICATING AUDIBLE TONE AND ALPHANUMERIC ANNUNCIATION.

27.2.3. VISUAL DEVICE TO BE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM. CONTRACTOR TO PROVIDE ALL ASSOCIATED DRIVERS, POWER SUPPLIES, CONDUIT, WIRE AND ACCESSORIES FOR A COMPLETE AND OPERATIONAL SYSTEM.

27.2.4. STROBE SHALL BE LISTED TO UL-5266 AND SUITABLE FOR OPERATION WITH EXISTING FIRE ALARM SYSTEM. THE V/O SHALL CONSIST OF A XENON FLASH TUBE AND ASSOCIATED LENS/REFLECTOR SYSTEM. THE V/O ENCLOSURE SHALL MOUNT DIRECTLY TO STANDARD SINGLE GANG, DOUBLE GANG OR 4" SQUARE ELECTRICAL BOX, WITHOUT THE USE OF SPECIAL ADAPTERS OR TRIM RINGS. V/O APPLIANCES SHALL BE PROVIDED WITH DIFFERENT MINIMUM ADJUSTABLE FLASH INTENSITIES OF 15CD, 30CD, 75CD AND 110CD. PROVIDE A LABEL INSIDE THE STROBE LENS TO INDICATE THE LISTED CANDELA RATING OF THE SPECIFIC VISIBLE/ONLY APPLIANCE. WHEN MULTIPLE STROBES AND THEIR REFLECTIONS CAN BE SEEN FROM ONE LOCATION PROVIDE STROBE FLASH SYNCHRONIZATION, QUANTITY, SPACING AND CANDELA DESIGN REQUIREMENTS OF VISUAL SIGNALS TO COMPLY TO CANULC 5524 STANDARD FOR THE INSTALLATION OF FIRE ALARM SYSTEMS SECTION 5.4.

#### 27.3. SYSTEM COMMISSIONING

27.3.1. INCLUDE IN THE BID THE COST FOR AN INDEPENDENT 3RD PARTY FIRE ALARM VERIFICATION IN ACCORDANCE WITH CANULC-S537. SUBMIT SEPARATE REPORTS TO THE CONSULTANT AND COMMISSIONING AGENT FOR REVIEW. ONCE APPROVED PROVIDE VERIFICATION CERTIFICATE TO LANDLORD AND INCLUDE A COPY IN THE OPERATIONS AND MAINTENANCE MANUAL.

27.3.2. THE ELECTRICAL CONTRACTOR IS TO MEASURE THE DECIBEL LEVEL (dBA) AND INTELLIGIBILITY LEVEL (CIS) OF THE FIRE ALARM SYSTEM AUDIBLE DEVICES ON THE FLOOR PRIOR TO FINAL INSPECTION BY THE AUTHORITIES HAVING JURISDICTION (AHJ). AUDIBILITY TESTING SHALL OCCUR AFTER ALL CEILINGS, WALLS AND FLOOR FINISHES ARE SUBSTANTIALLY COMPLETE AND REFLECTIVE OF THE FINAL ACOUSTICAL CONDITION. PLOT ALL READINGS ON A CAD DISK AND PDF DRAWING FOR REVIEW BY THE CONSULTANT. SUBMIT RESULTS TO THE AHJ IF REQUIRED.

27.3.3. PROVIDE INDEPENDENT 3RD PARTY VERIFICATION AND COMMISSIONING OF ALL LIFE SAFETY SYSTEMS INCLUDING EXIT LIGHTING, EMERGENCY LIGHTING AND OTHER LIFE SAFETY SYSTEMS. SUBMIT SEPARATE REPORTS TO THE CONSULTANT AND COMMISSIONING AGENT FOR REVIEW. INCLUDE COPY OF THE REPORT IN THE OPERATIONS AND MAINTENANCE MANUAL.

27.3.4. THE ELECTRICAL CONTRACTOR AND THE FIRE ALARM MANUFACTURER SHALL INCLUDE COSTS TO ALLOW SUFFICIENT TIME TO ASSIST AND PARTICIPATE IN THE TESTING OF INTEGRATED FIRE PROTECTION AND LIFE SAFETY SYSTEMS WHICH WILL BE CONDUCTED BY OTHERS IN ACCORDANCE TO CANULC-1001 "INTEGRATED SYSTEMS TESTING OF FIRE PROTECTION AND LIFE SAFETY SYSTEMS."

#### 28. DISTRIBUTION SURGE PROTECTIVE DEVICE (SPD)

28.1. SPD SHALL BE UL 1449 LISTED AND LABELED WITH THE FOLLOWING RATINGS: TYPE 2 DESIGNATION: 10kA 1-NOMINAL MINIMUM; 100kA SCCR MINIMUM; VPRS NOT TO EXCEED 700V IN L-N, L-G, N-G PROTECTION MODES FOR 120/208 SYSTEMS; VPRS NOT TO EXCEED 1500V IN L-N, L-G, N-G PROTECTION MODES FOR 347/600 SYSTEMS.

28.2. ALL OVERCURRENT PROTECTION AND OVER TEMPERATURE PROTECTION SHALL BE INCLUDED WITHIN THE DEVICE AND THE SPD SHALL AT A MINIMUM UTILIZE LARGE BLOCK 30MM MOV'S.

28.3. MINIMUM SURGE CURRENT RATINGS PER PHASE SHALL BE 200KA FOR DISTRIBUTION PANELS AND 100KA FOR SUB-DISTRIBUTION PANELS AND 50KA FOR POINT OF USE APPLICATIONS.

28.4. EVERY SUPPRESSION COMPONENT OF EVERY MODE, INCLUDING N-G, SHALL BE MONITORED AND THE SPD SHALL INCLUDE VISUAL INDICATION OF SPD OPERATION.

28.5. SPD SHALL BE INSTALLED AS CLOSE TO PANEL AS POSSIBLE WITH SHORT, EQUAL LENGTH LEADS.



ELECTRICAL SPECIFICATIONS

- 1.8. USE RIGID STEEL CONDUIT UP TO 2.4M (8'-0") ABOVE FINISHED FLOOR WHERE EXPOSED INDOORS AND IN ALL OUTDOOR LOCATIONS.
- 1.9. THE MINIMUM CONDUIT SIZE (INCLUDING ALL UNDIMENSIONED CONDUITS IN THESE DRAWINGS) SHALL BE 21 MM (3/4").
2. SPLITTERS, JUNCTION BOXES AND PULL BOXES
- 2.1. SPLITTERS SHALL HAVE SHEET STEEL ENCLOSURE, WITH WELDED CORNERS AND FORMED HINGED COVER SUITABLE FOR LOCKING IN CLOSED POSITION. CONNECTION BARS ARE TO MATCH REQUIRED SIZE AND NUMBER OF INCOMING AND OUTGOING CONDUCTORS AS INDICATED.
- 2.2. JUNCTION BOXES AND PULLBOXES SHALL BE SUITABLE FOR SURFACE MOUNTING AND BE OF WELDED STEEL CONSTRUCTION WITH SCREW-ON FLAT COVERS.
- 2.3. FOR FLUSH-MOUNTED PULL AND JUNCTION BOXES, PROVIDE COVERS WITH 27MM (1") MINIMUM EXTENSION ALL AROUND.
- 2.4. INSTALL JUNCTION AND PULL BOXES IN INCONSPICUOUS BUT ACCESSIBLE LOCATIONS.
- 2.5. A MINIMUM OF ONE PULL BOX SHALL BE INSTALLED FOR EVERY 100 FT. (30M) OF CONDUIT. (NOTE: EACH 90 DEG. BEND SHALL EQUATE TO A 30 FT. (9M) LENGTH OF CONDUIT).
- 2.6. NO MORE THAN TWO (2) - 90 DEG. BENDS SHALL BE INSTALLED BETWEEN ANY TWO ADJACENT PULL BOXES.
- 2.7. ENSURE ALL FIRE ALARM JUNCTION ACCESS ENCLOSURES ARE CLEARLY LABELLED AS "FIRE ALARM".
3. OUTLET BOXES
- 3.1. OUTLET BOXES SHALL BE ELECTRO-GALVANIZED STEEL, SIZED AS REQUIRED BY CODE.
- 3.2. PROVIDE EACH LIGHT SWITCH, RECEPTACLE, COMMUNICATION AND OTHER OUTLET WITH AN OUTLET BOX. INSTALL PLUMB AND TRUE. PROVIDE 76MM (3") DEEP 1004 BOXES FOR DIMMING SWITCHES AND LOW VOLTAGE OUTLET BOXES.
- 3.3. ADAPT ALL OUTLET BOXES TO THEIR RESPECTIVE LOCATIONS AND SUPPORT INDEPENDENTLY OF THE CONDUIT. DO NOT CADDIE CLIP TO CEILING HANGERS.
- 3.4. PROVIDE BLANK COVERPLATES FOR BOXES WITHOUT WIRING DEVICES.
- 3.5. DO NOT INSTALL OUTLET BOXES BACK TO BACK IN PARTITIONS. STAGGER TO PREVENT SOUND TRANSFER.
- 3.6. TWO OR MORE OUTLET BOXES THAT OCCUR AT THE SAME LOCATION SHALL BE GANGED TOGETHER IN THE SAME COVERPLATE UNLESS OTHERWISE NOTED.
- 3.7. PROVIDE "FS" OR "FD" FERALOY BOXES FOR ALL SURFACE MOUNTED DEVICES, INCLUDING FIRE ALARM, SECURITY AND AUXILIARY SYSTEMS.
4. GROUNDING
- 4.1. GROUND ALL EQUIPMENT IN ACCORDANCE WITH LATEST EDITION OF THE ELECTRICAL SAFETY CODE. PROVIDE SEPARATE GREEN INSULATED GROUND CONDUCTOR IN EVERY CONDUIT TO ALL DEVICES, LUMINAIRES AND FEEDERS (PANELBOARDS, SPLITTERS, DISCONNECT SWITCHES, ETC.).
5. WIRE AND CABLE
- 5.1. ALL WIRE AND CABLE SHALL BE COPPER, MINIMUM 12 GAUGE, NO. 12 AND NO. 10 SOLID, NO. 8 AND LARGER STRANDED, WITH RW90XLPE INSULATION, 600VOLT RATING.
- 5.2. BX#12 MAY BE USED IN CEILING SPACE FROM CEILING DISTRIBUTION BOX DOWN TO RECEPTACLES IN PARTITIONS. BX RUNS IN CEILING SPACE NOT TO EXCEED 3048MM (10'-0") IN LENGTH. DO NOT RUN BX CABLES INTO PANELBOARDS.
- 5.3. WALL MOUNTED DEVICES SHALL BE FED VERTICALLY. HORIZONTAL RUNS THROUGH PARTITIONS SHALL NOT BE PERMITTED, EXCEPT IN LOW HEIGHT PARTITIONS OR WHERE NOTED ON DRAWINGS.
- 5.4. SIZE ALL WIRE FOR MAXIMUM 2% VOLTAGE DROP.
- 5.5. ALL HOME RUNS TO BE IN CONDUIT.
6. LOCAL SWITCHES
- 6.1. LIGHT SWITCHES SHALL MATCH BASE BUILDING STANDARD. WHERE NO STANDARD EXISTS, PROVIDE SPECIFICATION GRADE LOCAL 20A, 120 VOLT AND 347 VOLT SWITCHES, A.C. TYPE WITH MATCHING COVERPLATE:

120 VOLT  
P&S #2621 SERIES  
HUBBELL #HBL2121 SERIES  
LEVITON #6621-2 SERIES

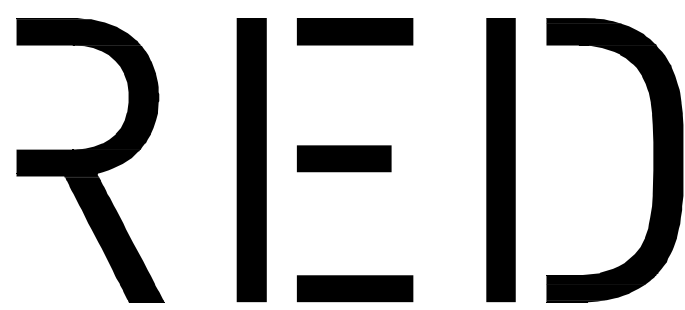
347 VOLT  
P&S #2601-347 SERIES  
LEVITON #6621-C-347 SERIES
- 6.2. OCCUPANCY SENSOR LIGHT SWITCH SHALL MATCH BASE BUILDING STANDARD. WHERE NO STANDARD EXISTS SENSOR SHALL BE HUBBELL DUAL TECHNOLOGY OCCUPANCY SENSORS LHMTS-1-WH OR EQUAL BY WATTSOPPER, CRESTRON OR NIGHT SUITABLE FOR 120V OR 347V AS REQUIRED. SENSOR SHALL BE MANUAL "ON" WITH AUTO-OFF FUNCTION AND C/W FIELD ADJUSTABLE VIEWING ANGLE AND ADAPTIVE TECHNOLOGY. PROVIDE INDIVIDUAL TIME AND SENSOR ADJUSTMENT TO CLIENT'S REQUIREMENTS.
- 6.3. CEILING MOUNTED ADAPTIVE TECHNOLOGY OCCUPANCY SENSORS SHALL MATCH BASE BUILDING STANDARD. WHERE NO STANDARD EXISTS SENSOR SHALL BE HUBBELL DUAL TECHNOLOGY OCCUPANCY SENSORS OMNI-DOT OR APPROVED EQUAL BY WATTSOPPER, CRESTRON OR NIGHT SUITABLE FOR 120V OR 347V AS REQUIRED. SENSOR SHALL BE C/W POWER PACK AND ALL NECESSARY WIRING ACCESSORIES AND SUITABLE FOR 500, 1000 OR 2000 SQ. FT. AS REQUIRED. PROVIDE INDIVIDUAL TIME AND SENSOR ADJUSTMENT TO CLIENT'S REQUIREMENTS.
- 6.4. REFER TO LEGEND FOR OTHER TYPES.
7. LIGHTING CONTROL SYSTEMS
- 7.1. INCLUDE FOR ALL NECESSARY RELAYS, INTERFACES, POWERPACKS, ETC REQUIRED FOR A COMPLETE AND FUNCTION SYSTEM. REFER TO LIGHTING CONTROL DRAWINGS FOR MORE INFORMATION. INCLUDE FOR A SUFFICIENT AMOUNT OF TIME FOR ALL NECESSARY PROGRAMMING AND COMMISSIONING OF LIGHTING CONTROL SYSTEM.
- 7.2. ELECTRICAL CONTRACTOR SHALL INCLUDE FOR A CONNECTION TO THE BASE BUILDING FIRE ALARM SYSTEM TO ENSURE THAT ALL LIGHTS ARE BROUGHT TO FULL BRIGHTNESS IN THE EVENT OF A FIRE ALARM. PROVIDE ALL NECESSARY INTERFACES/MODULES FOR BOTH THE FIRE ALARM AND LIGHTING CONTROL SYSTEMS.
- 7.3. WHERE TENANT'S LIGHTING CONTROL SYSTEM IS NOT INTEGRATED WITH THE BASE BUILDING LIGHTING CONTROL SYSTEM, INCLUDE FOR TIE IN TO BASE BUILDING LIGHTING CONTROL SYSTEM VIA NETWORK/RS232 INTERFACE.
- 7.4. VERIFY SEQUENCE OF OPERATIONS OF LIGHTING CONTROL SYSTEM WITH CLIENT PRIOR TO FINAL PROGRAMMING.
- 7.5. ENSURE THAT EACH LIGHTING TYPE WITHIN A GIVEN ZONE OR AREA RECEIVES A DEDICATED POWER PACK THAT MATCHES THE DIMMING PROTOCOL OF THE SPECIFIED FIXTURE. EMERGENCY LIGHT FIXTURES WITHIN A GIVEN ZONE SHALL RECEIVE A DEDICATED UL 924 LISTED EMERGENCY POWER PACK THAT MATCHES THE DIMMING PROTOCOL OF THE SPECIFIED FIXTURE.
- 7.6. FINAL ADJUSTMENT OF ALL LIGHTING LEVELS SHALL BE DONE IN THE PRESENCE OF THE CONSULTANT/CLIENT. ELECTRICAL CONTRACTOR TO NOTIFY THE CONSULTANT IN WRITING A MINIMUM OF 3 DAYS PRIOR TO REQUIRED SITE VISIT. VISIT SHALL BE SCHEDULED ONCE THE SITE IS SUBSTANTIALLY COMPLETE WITH ALL FURNITURE INSTALLED AND ALL PAINTING COMPLETED.
- 7.7. ELECTRICAL CONTRACTOR SHALL INCLUDE TO RETURN TO SITE 3 MONTHS AFTER SUBSTANTIAL COMPLETION ALONG WITH LIGHTING CONTROL MANUFACTURER TO ADJUST PROGRAMMING OF THE LIGHTING CONTROL SYSTEM TO SUIT CLIENT NEEDS.
- 7.8. WHERE POSSIBLE, RUN ALL LIGHTING CONTROL WIRING WITHIN THE SAME CONDUIT AS THE BRANCH CIRCUIT WIRING. WHERE WIRING IS NOT CLASS 1 RATED, SEPARATE LIGHTING CONTROL CONDUIT SHALL BE PROVIDED FOR ALL CONTROL WIRING.
8. RECEPTACLES
- 8.1. PROVIDE SPECIFICATION GRADE 15A, 120 VOLT, "N" GROUND DUPLEX RECEPTACLES, WITH MATCHING COVERPLATES. RECEPTACLES SHALL BE OF THE "DESIGNER" RECTILINEAR STYLE.
- 8.2. REFER TO LEGEND FOR OTHER TYPES.
- 8.3. RECEPTACLES SHALL HAVE CIRCUIT NUMBER IDENTIFIED ON THE WALL PLATE VIA SELF-ADHESIVE VINYL LABEL AND FURTHER IDENTIFIED WITH THE EXACT LOCATION LISTED IN THE PANEL DIRECTORY.
9. DIMMERS
- 9.1. PROVIDE DIMMERS WITH LINEAR SLIDE CONTROL, SIZED TO SUIT LOADS CONTROLLED FOR FLUORESCENT, INCANDESCENT, LED, 0-10V, LOW VOLTAGE MAGNETIC AND LOW VOLTAGE ELECTRONIC LIGHTING AS INDICATED.
- 9.2. ALL DIMMERS SHALL INCORPORATE AN AIR GAP WHICH SHALL BE ACCESSIBLE WITHOUT REMOVING THE FACEPLATE; MEET THE U.L. 20 U.L. 1472 LIMITED SHORT CIRCUIT TEST STANDARD C22.41-1980. TESTED TO WITHSTAND VOLTAGE SURGES OF UP TO 6000V. AND CURRENT SURGES OF UP TO 200A WITHOUT DAMAGE. MANUFACTURER SHALL PROVIDE FILE CARD UPON REQUEST SHOWING THEIR COMPLIANCE WITH THE ABOVE STANDARDS.
- 9.3. DIMMERS SHOWN SIDE BY SIDE SHALL BE GANGED UNDER ONE SEAMLESS, MULTI-GANG FACEPLATE.
- 9.4. DIMMERS SHALL BE OF LUTRON NOVA T SERIES OR APPROVED EQUAL, UNLESS NOTED OTHERWISE.
- 9.5. WHEN FLUORESCENT AND/OR COMPACT FLUORESCENT LAMPS ARE TO BE DIMMED, PROVIDE EITHER LUTRON ECO-10 OR LUTRON HI-LUME DIMMING BALLASTS AS SPECIFIED IN LUMINAIRE SCHEDULE. OPERATE LAMPS AT FULL BRIGHTNESS FOR A MINIMUM 100 HOURS PRIOR TO DIMMING.
10. MECHANICAL TRADES WIRING
- 10.1. UNLESS OTHERWISE NOTED, ALL STARTERS AND CONTROL WIRING TO BE PROVIDED BY MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR TO RECEIVE, INSTALL STARTERS AND PROVIDE ALL LINE-SIDE AND LOAD-SIDE POWER WIRING AND REQUIRED ISOLATING DISCONNECT SWITCHES.
- 10.2. CONFIRM ELECTRICAL REQUIREMENTS AND EXACT LOCATIONS OF ALL MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR PRIOR TO INSTALLATION.
11. LUMINAIRES
- 11.1. PROVIDE ALL LUMINAIRES AS SHOWN ON THE DRAWINGS AND AS SPECIFIED IN THE LUMINAIRE SCHEDULE.
- 11.2. ALL LUMINAIRES SHALL BE COMPLETE WITH NEW LAMPS, BALLASTS, ACCESSORIES AND MOUNTING APPURTENANCES.

- 11.3. ALL LUMINAIRES TO BE CSA APPROVED.
- 11.4. AIM AND ADJUST ALL LUMINAIRES IN PRESENCE OF CONSULTANT.
- 11.5. ALL NEW DOWNLIGHT AND SURFACE MOUNTED LUMINAIRES INSTALLED IN OR ON THE BASE BUILDING CEILINGS SHALL BE INDEPENDENTLY SUPPORTED FROM BUILDING STRUCTURE WITH TENSO CHAINS UNLESS OTHERWISE NOTED. INCLUDE TO TRIM ALL NECESSARY SUPPORT CABLES, POWER CABLES, ETC TO SUIT THE APPROPRIATE LENGTH OF FINAL FIXTURE SUPPORT. ANY ADDITIONAL CABLING SHALL BE NEATLY DRESSED AND CONCEALED WHEREVER POSSIBLE.
- 11.6. UNLESS WRITTEN CONFIRMATION CAN BE PROVIDED THAT THE EXISTING BASE BUILDING CEILING HAS BEEN DESIGNED AND CONSTRUCTED TO SUPPORT THE ADDITIONAL WEIGHT OF THE BASE BUILDING LUMINAIRES, THE ELECTRICAL CONTRACTOR SHALL PROVIDE ADDITIONAL SUPPORTS ON ALL NEW BASE BUILDING LUMINAIRES BEING ADDED AND ON ALL RELOCATED EXISTING LUMINAIRES. ALL TROFFER FIXTURES SHALL BE SUPPORTED WITH 2 TENSO CHAINS FROM STRUCTURE ABOVE. ALL DOWNLIGHTS SHALL BE SUPPORTED WITH A MINIMUM OF ONE TENSO CHAIN. INCLUDE COST IN TENDER PRICE.
- 11.7. EACH LUMINAIRE INSTALLED ON BRANCH CIRCUITS WITH VOLTAGES EXCEEDING 150 VOLTS-TO-GROUND, SHALL BE:

(A)PROVIDED WITH A DISCONNECTING MEANS INTEGRAL WITH THE LUMINAIRE THAT SIMULTANEOUSLY OPENS ALL CIRCUIT CONDUCTORS BETWEEN THE BRANCH CIRCUIT CONDUCTORS AND THE CONDUCTORS SUPPLYING THE BALLAST(S); AND  
(B)MARKED IN A CONSPICUOUS, LEGIBLE, AND PERMANENT MANNER ADJACENT TO THE DISCONNECTING MEANS, IDENTIFYING THE SPECIFIC PURPOSE.
- 11.8. COOPERATE WITH ALL OTHER TRADES FOR THE PROPER INSTALLATION OF ALL LUMINAIRES.
- 11.9. ACCEPTABLE MANUFACTURERS FOR ALL TYPES OF LAMPS OF ALL SPECIFIED LUMINAIRES SHALL BE OSRAM SYLVANIA, PHILIPS OR GE. UNLESS OTHERWISE NOTED, BALLASTS AND LAMPS MUST BE BY THE SAME MANUFACTURER.
- 11.10. WITH JUST EMERGENCY LIGHTING IN OPERATION, AND AT NIGHT, THE ELECTRICAL CONTRACTOR IS TO MEASURE THE "AVERAGE" ILLUMINATION AT THE FLOOR LEVEL ALONG THE PRINCIPAL EGRESS ROUTES PROVIDING ACCESS TO EXITS. TAKE MULTIPLE READINGS ALONG THE PATHWAY AT AN APPROPRIATE INTERVAL NOT TO EXCEED 10' O.C. THAT ALLOWS FOR MAXIMUM AND MINIMUM VALUES TO BE ESTABLISHED AND RECORD ALL LIGHTING RESULTS ON A CAD DISK OR PDF SET OF DRAWINGS FOR SUBMISSION TO THE CONSULTANT. SUBMISSION TO THE BUILDING INSPECTION AUTHORITIES TO BE BY THE ELECTRICAL CONTRACTOR. ADDITIONALLY, WHERE EMERGENCY LIGHTING IS ACHIEVED THROUGH UNIT EQUIPMENT CONFORMING TO CSA C22.2 NO. 11 ELECTRICAL CONTRACTOR SHALL TEST THE RUNTIME OF ALL UNIT EQUIPMENT AND REPORT TO THE CONSULTANT IN WRITING. INCLUDE RUNTIME VERIFICATION IN CLOSEOUT DOCUMENTS.
12. MEGGERING AND BALANCING
- 12.1. MEGGER ALL POWER CIRCUIT FEEDERS. IF GROUND RESISTANCE ON ANY CIRCUIT IS LESS THAN THAT REQUIRED BY CSA OR OTHER GOVERNING REGULATIONS, SUCH CIRCUITS ARE TO BE CONSIDERED DEFECTIVE AND MUST BE REPLACED.
- 12.2. MEASURE PHASE CURRENT TO PANELBOARDS WITH NORMAL LOADS OPERATING AT TIME OF ACCEPTANCE. ADJUST BRANCH CIRCUIT CONNECTIONS AS REQUIRED TO OBTAIN BEST BALANCE OF CURRENT BETWEEN PHASES AND SUBMIT A REPORT FOR INSERTION INTO MANUALS.
13. SERVICE EQUIPMENT
- 13.1. ALL NEW PANELBOARDS, DISCONNECT SWITCHES, METERS, TRANSFORMERS, ETC., TO BE COPPER WINDINGS/BUS-BARS, SAME MANUFACTURE, RATING AND TYPE AS BASE BUILDING EQUIPMENT UNLESS OTHERWISE NOTED. MOLDED CASE CIRCUIT BREAKERS TO BE BOLT-ON AND SAME MANUFACTURER, RATING AND TYPE AS BASE BUILDING BREAKERS. ALL AT'S AND SURFACE MOUNTED PANELBOARDS TO BE SPRINKLERPROOF. IF UNABLE TO MATCH BASE BUILDING EQUIPMENT, ONE OF THE FOLLOWING MANUFACTURER'S EQUIPMENT MUST BE PROVIDED:

SCHNEIDER  
EATON  
SIEMENS
- 13.2. ALL NEW PANELBOARDS SHALL BE COMPLETE WITH 200% RATED NEUTRAL BUS.
- 13.3. ALL MAIN BREAKERS SHALL BE SEPARATELY MOUNTED ON TOP OR BOTTOM OF PANEL TO SUIT CABLE ENTRY.
- 13.4. DRY TYPE TRANSFORMERS SHALL BE MANUFACTURED TO CSA C22.2 NO. 47, CSA C9 AND CAN/CSA C802 AND SHALL MEET NRCAN 2019 AND ONTARIO GREEN ACT. ON REG. 404.12, TRANSFORMERS SHALL BE OF THE SAME MANUFACTURER AS THE BASE BUILDING BUT WITH A DESIGN K FACTOR OF 1.5 AND WITH ELECTROSTATICALLY SHIELDED, COPPER WINDINGS. PROVIDE DOUBLE LUGS ON TRANSFORMER NEUTRALS FOR CONNECTION OF CABLES. TRANSFORMERS SHALL NOT BE "T-TAP" TYPE. TRANSFORMER IMPEDANCE NOT TO EXCEED 6% AT 170 DEG. C. IF UNABLE TO MATCH BASE BUILDING TRANSFORMER, ONE OF THE FOLLOWING MANUFACTURERS TRANSFORMERS MUST BE PROVIDED:

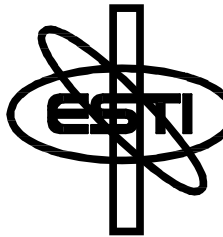
SCHNEIDER DELTA ACME HUBBELL ATLAS  
HAMMOND STI REX
- 13.5. CEILING MOUNT TRANSFORMERS UP TO 45 KVA WITH SUSPENSION RODS AND SPRING ISOLATORS, TRANSFORMERS 60 KVA AND LARGER TO BE FLOOR MOUNTED ON KORFUND ISOLATION PADS UNLESS OTHERWISE NOTED.
- 13.6. ALL FLOOR MOUNTED DISTRIBUTION EQUIPMENT, INCLUDING TRANSFORMERS, PANELBOARDS AND/OR UPS MODULES SHALL BE INSTALLED ON A 100MM (4") HIGH CONCRETE BASE TO EXTEND 50MM (2") ON ALL SIDES WITH CHAMFERED CORNERS. ALL CONCRETE WORK TO BE INCLUDED IN THIS DIVISION.
- 13.7. PROVIDE A CONCRETE BASE 100MM (4") HIGH AT ALL SLEEVE LOCATIONS AND CONDUITS PENETRATING THE FLOOR SLAB. CONCRETE BASE TO EXTEND 100MM (4") BEYOND THE EDGE OF THE SLEEVE OR CONDUIT. ALL CONCRETE WORK TO BE INCLUDED IN THIS DIVISION.
14. CABLE TROUGHS
- 14.1. CABLE TROUGHS, AS DEFINED IN CSA C22.2, NO. 126, ACCESSORIES AND FITTINGS SHALL BE MANUFACTURED TO EMAC F5.1.
- 14.2. UNLESS OTHERWISE NOTED, POWER SYSTEMS CABLE TRAYS SHALL BE VENTILATED STEEL, CLASS C1, WITHOUT COVER, SIZED AS INDICATED AND WITH A NATURAL FINISH.
- 14.3. UNLESS OTHERWISE NOTED, VOICE/DATA/HUB ROOM CABLE TRAYS SHALL BE BASKET STYLE, PRE-GALVANIZED, CLASS C1, SIZED AS INDICATED AND WITH A NATURAL FINISH.
- 14.4. SUPPORTS SHALL BE ROD AND CHANNEL OF A SIZE TO SUIT TOTAL LOAD. PROVIDE "Z" BRACKETS TO BE INSTALLED AT EXTERIOR OF CABLE TRAYS TO PREVENT DAMAGE TO CABLES.
- 14.5. SUPPLY ALL BENDS, ELBOWS, END PLATES, DROP OUTS, TEES, WYES AND EXPANSION JOINTS FOR THE COMPLETE SYSTEM AS REQUIRED. PROVIDE PLASTIC CAPS ON ALL INTERNAL BOLTS WITHIN CABLE TRAY WHICH ARE USED TO JOIN BARRIER STRIPS AND FITTINGS.
- 14.6. REMOVE SHARP EDGES TO PREVENT CABLE DAMAGE OR INJURY TO PERSONNEL.
- 14.7. PROVIDE GROUNDING FOR ALL CABLE TROUGHS AS PER THE O.E.S.C.
15. DRY WALL CEILINGS
- 15.1. IN ALL DRYWALL CEILING AREAS, ELECTRICAL CONTRACTOR IS TO REMOVE AND RELOCATE ALL EXISTING JUNCTION BOXES TO ACCESSIBLE CEILING SPACE
- 15.2. PROVIDE ACCESS PANELS FOR ALL NEW AND EXISTING DEVICES AS REQUIRED.
16. BREAKERS
- 16.1. PROVIDE BREAKER LOCKS FOR ALL NEW AND EXISTING BREAKERS SERVING EXIT LIGHTS, EMERGENCY LIGHTING AND EMERGENCY BATTERY PACKS.
- 16.2. PROVIDE 15A, 1P G.F.I. BREAKER FOR ALL DUPLEX RECEPTACLES AND 15A, 2P G.F.I. BREAKER FOR ALL SPLIT RECEPTACLES INSTALLED WITHIN 1.5 METERS (5') OF SINK, SHOWER, ETC.
- 16.3. TANDEM BREAKERS SHALL NOT BE UTILIZED.
17. FUSES
- 17.1. FUSES PROTECTING MOTOR LOADS, ELEVATORS AND TRANSFORMERS SHALL BE TIME DELAY, CAPABLE OF CARRYING 500% OF ITS RATED CURRENT FOR 10S MINIMUM AND SHALL BE CLASS J FOR UP TO AND INCLUDING 600A AND CLASS L FOR RATINGS ABOVE 600A.
- 17.2. FUSES PROTECTING SERVICE ENTRANCE AND FEEDER CIRCUITS SHALL BE FAST ACTING AND SHALL BE CLASS J FOR UP TO AND INCLUDING 600A AND CLASS L FOR RATINGS ABOVE 600A.



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NO.	DESCRIPTION	DATE
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2	ISSUED FOR PERMIT	2025-02-10
3	ISSUED FOR TENDER	2025-04-17



PROJECT INFORMATION

KELSO ARRIVAL CENTRE  
5234 KELSO ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE

ELECTRICAL SPECIFICATIONS  
PAGE 2 OF 2

PROJECT NO.: 241278  
DATE: 2025-04-17  
SCALE: N.T.S.  
DRAWN BY: MS  
REVIEWED BY: BF

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PROJECT INFORMATION

KELSO ARRIVAL CENTRE  
5234 KELSO ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE

GROUND FLOOR – POWER AND  
SYSTEMS PLAN

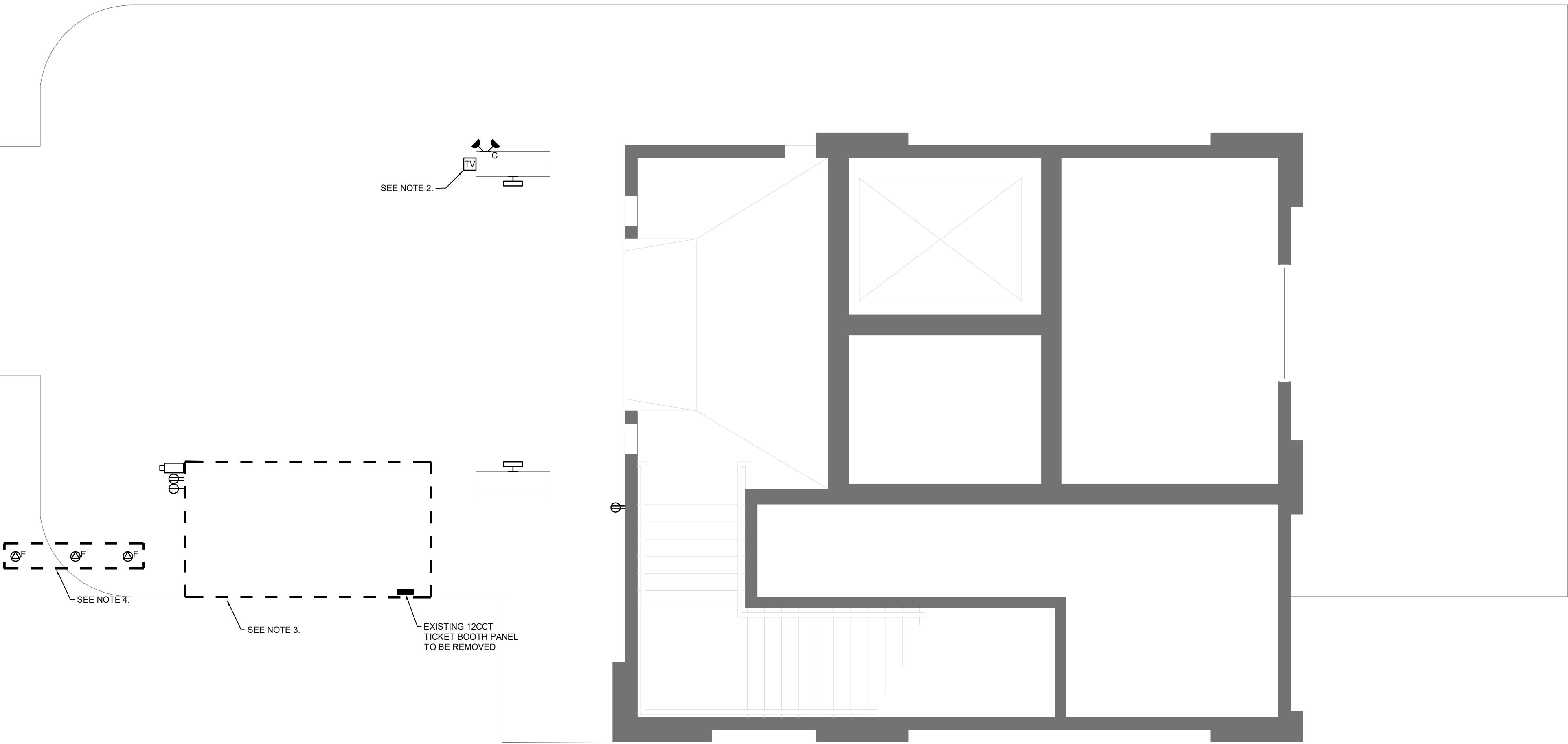
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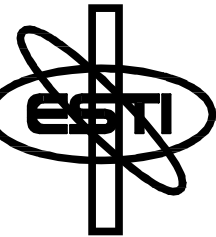
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NOTES:

- ALL DEVICES SHOWN ARE TO BE REMOVE UNLESS OTHERWISE NOTED.
- ELECTRICAL CONTRACTOR TO REMOVE TV. RETURN POWER & COMMUNICATIONS BACK TO SOURCE.
- ELECTRICAL CONTRACTOR TO REMOVE ALL DEVICES, LIGHTING AND WIRING FROM EXISTING TICKETING BOOTH. REMOVE PANEL FEEDER CABLES FROM SOURCE.
- ELECTRICAL CONTRACTOR TO REMOVE RFID CARD DISPENSERS AND RELOCATE TO LOCATION SHOWN ON E-301.





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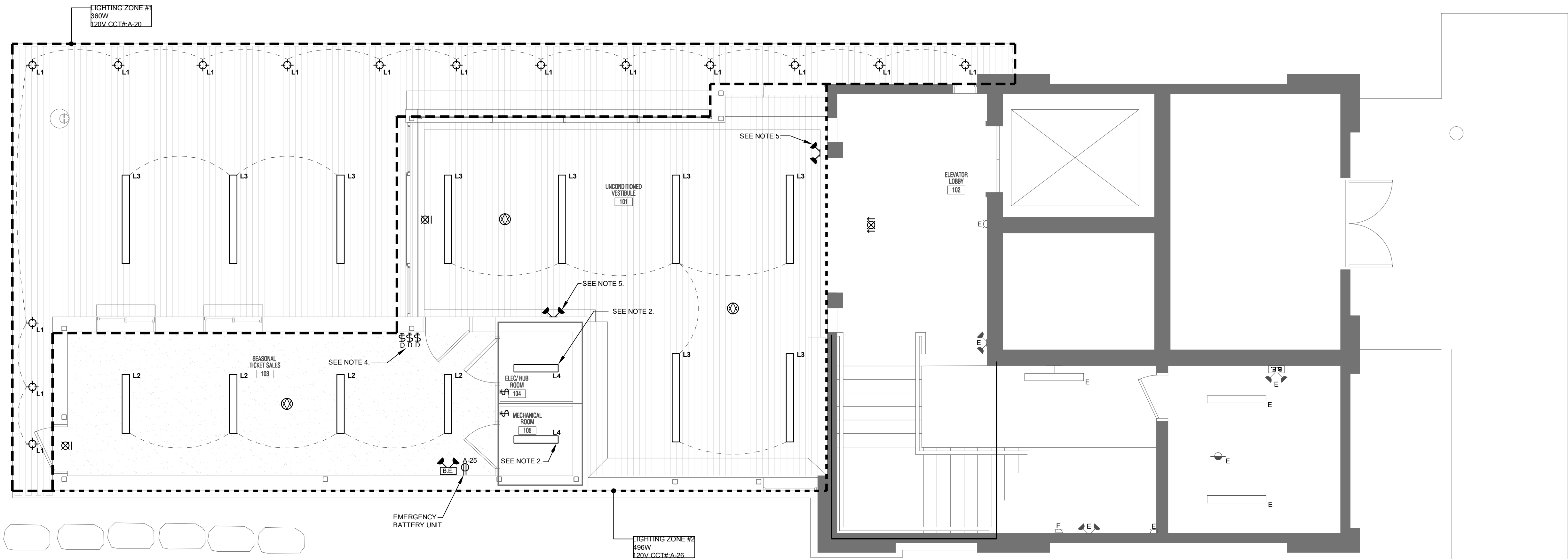


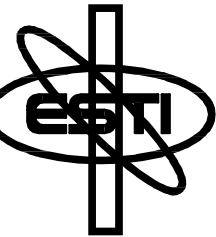
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DRAWING TITLE	
GROUND FLOOR – LIGHTING PLAN	

PROJECT NO.: 241278	DRAWN BY: MS
DATE: 2025-04-17	REVIEWED BY: BF
SCALE: 1:50	

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- NOTES:
- ALL EXISTING LIGHTING TO REMAIN IN ELEVATOR LOBBY
  - ELECTRICAL ROOM & MECHANICAL ROOM HAVE NO CEILING, LIGHT FIXTURES TO BE SUSPENDED.
  - EXIT SIGNS TO BE PUT ON LOCKING CIRCUIT. REFER TO PANEL SCHEDULE IN E-601.
  - MASTER SWITCHES TO CONTROL LIGHTING OUTSIDE OF BUILDING, LIGHTING INSIDE OF UNCONDITIONED VESTIBULE - 101, AND SEASONAL TICKET SALES - 103.
  - NEW EMERGENCY LAMP UNITS TO BE CONNECTED TO NEW EMERGENCY BATTERY UNIT LOCATED IN SEASONAL TICKET SALES - 103.





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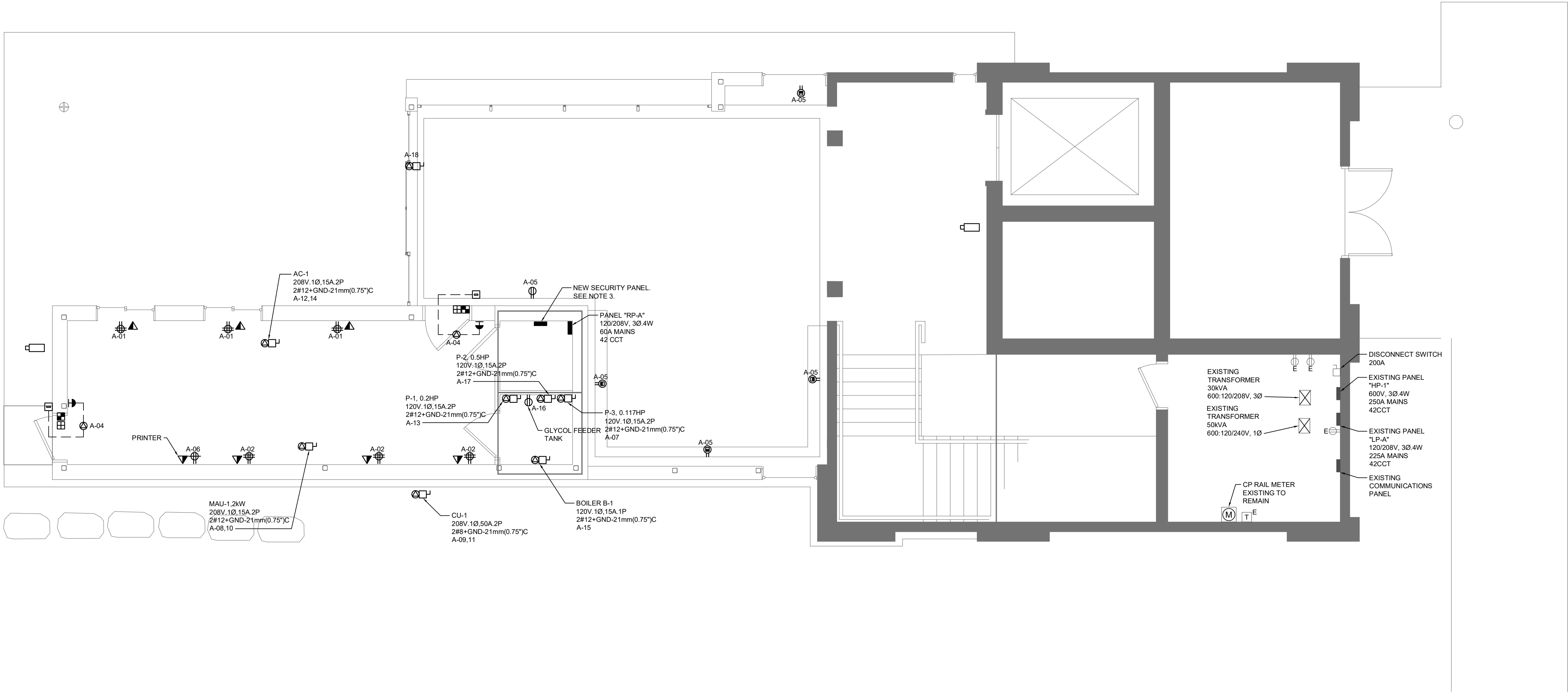
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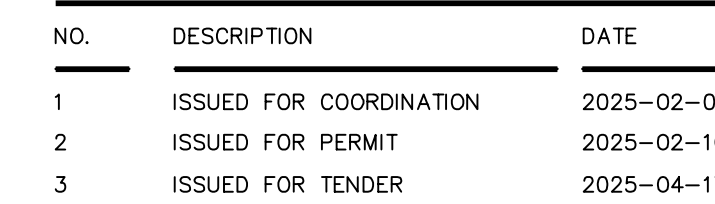
PROJECT INFORMATION	
KELSO ARRIVAL CENTRE 5234 KELSO ROAD MILTON, ON L9E 0C6	
DRAWING TITLE	
GROUND FLOOR – POWER AND SYSTEMS PLAN	
PROJECT NO.: 241278	DRAWN BY: MS
DATE: 2025-04-17	REVIEWED BY: BF
SCALE: 1:50	

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- NOTES:
- ELECTRICAL CONTRACTOR TO INCLUDE TO INVESTIGATE AND UTILIZE THE NEAREST EXISTING SPACE CIRCUITS FROM EXISTING ELECTRICAL PANEL. INCLUDE TO PULL NEW CIRCUITS AS REQUIRED.
  - RFID CARD DISPENSER TO BE FED EXISTING POWER AND DATA FROM PREVIOUS LOCATION.
  - ALL COMMUNICATIONS AND SECURITY ROUGH-INS MUST GO BACK TO BACKBOARD IN ELECHUB ROOM. REFER TO SECURITY BACKBOARD DETAIL ON E-601.







1 PANEL SCHEDULES  
601 SCALE: N.T.S.



GENERAL NOTES

A. GENERAL INFORMATION

1. READ STRUCTURAL DOCUMENTS IN CONJUNCTION WITH CONTRACT DOCUMENTS, WHICH INCLUDE, BUT ARE NOT LIMITED TO, ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DOCUMENTS.
2. CONTRACTOR TO BE RESPONSIBLE FOR CHECKING SITE CONDITIONS AGAINST DOCUMENTS BEFORE PROCEEDING WITH THE WORK, AND REPORT DISCREPANCIES TO THE CONSULTANT.
3. CONTRACTOR TO PROVIDE LABOUR, MATERIALS, AND EQUIPMENT TO COMPLETE ALL STRUCTURAL WORK INDICATED.
4. CARRY OUT CONSTRUCTION OPERATIONS, INCLUDING THE INSTALLATION OF TEMPORARY GUYING AND SHORING REQUIRED, ENSURING THAT THE EXISTING STRUCTURE OR MEMBERS ALREADY ERECTED ARE NOT LOADED IN EXCESS OF THEIR SAFE LOAD CARRYING CAPACITY.
5. STRUCTURAL DOCUMENTS DO NOT NECESSARILY SHOW ALL OPENINGS AND SLAB VARIATIONS REQUIRED. THE CONTRACTOR SHALL REFER TO ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR THE EXACT LOCATION, NUMBER, AND SIZE OF OPENINGS, TRENCHES, PITS, SUMPS, SLEEVES, AND DEPRESSIONS. PROVIDE STRUCTURAL FRAMING AT THESE LOCATIONS IN ACCORDANCE WITH THE APPLICABLE TYPICAL DETAIL.

B. REFERENCE STANDARDS / CODES AND ACTS

1. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH AND SHALL BE CONSTRUCTED TO CONFORM WITH THE 2024 ONTARIO BUILDING CODE, ONTARIO REGULATION 163/24 (REFERRED TO AS "THE BUILDING CODE"), ANY APPLICABLE ACTS OF ANY AUTHORITY HAVING JURISDICTION, AND THE FOLLOWING:

TABLE B.1: REFERENCE STANDARDS

REF	CODE	TITLE
a)	CAN/CSA A23.1	CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION
b)	CAN/CSA A23.2	METHODS OF TEST FOR CONCRETE
c)	CAN/CSA A23.3	DESIGN OF CONCRETE STRUCTURES
d)	CAN/CSA-S16	LIMIT STATES DESIGN OF STEEL STRUCTURES
e)	S136	COLD FORMED STEEL STRUCTURAL MEMBERS
f)	CAN/CSA G40.20/G40.21	STRUCTURAL QUALITY STEEL
g)	RSIC	REINFORCING STEEL INSTITUTE OF CANADA (RSIC), MANUAL OF STANDARD PRACTICE
h)	O86	ENGINEERING DESIGN IN WOOD (LIMIT STATES DESIGN)

2. ALL STANDARDS AND PUBLICATIONS REFERENCED BY THE STANDARDS NOTED ABOVE ARE TO APPLY.
3. WHERE THERE ARE DIFFERENCES BETWEEN THE DOCUMENTS AND THE STANDARDS, CODES AND ACTS, THE MOST STRINGENT SHALL GOVERN.
4. THE SEISMIC CATEGORY IS SC2. FOR THE DETERMINATION OF THE SEISMIC CATEGORY, THE SITE CLASS IS ASSUMED TO BE D.

C. SUBMITTALS

1. SUBMIT FOR REVIEW BY THE VARIOUS CONSULTANTS, DETAILED INFORMATION FOR ALL TEMPORARY AND PERMANENT STRUCTURAL WORK. THIS INCLUDES, BUT IS NOT LIMITED TO:

TABLE C.1: REQUIRED SUBMITTALS

ITEM	SUBMISSION REQUIRED	SUBMISSION TO BE SEALED BY PROFESSIONAL ENGINEER	COMMENTS
REINFORCED STEEL (REBAR) SHOP DRAWINGS	YES	NO	
STRUCTURAL STEEL SHOP DRAWINGS	YES	YES	
PRE-ENGINEERED ROOF TRUSSES	YES	YES	

2. CONTRACTOR SHALL ALLOW FOR A TURN AROUND TIME OF FIVE WORKING DAYS FOR THE REVIEW OF THESE SUBMISSIONS.
3. OUR REVIEW OF THE SHOP DRAWINGS IS ONLY FOR GENERAL CONFORMITY WITH STRUCTURAL CONTRACT DOCUMENTS AND SPECIFICATIONS. COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE STRUCTURAL CONTRACT DOCUMENTS AND SPECIFICATIONS, NOR DO THEY AUTHORIZE ANY CHANGES TO THE CONTRACT. REVIEW OF A SPECIFIC ITEM SHALL NOT INCLUDE REVIEW OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. THE CONTRACTOR'S RESPONSIBILITIES INCLUDE: ALL QUANTITIES; DETAIL DIMENSIONS; FIELD MEASUREMENTS; FABRICATION PROCESS, MEANS, METHODS, SEQUENCES, AND PROCEDURES OF CONSTRUCTION, COORDINATION OF WORK WITH ALL TRADES AND PERFORMING ALL WORK IN A SAFE AND SATISFACTORY MANNER. THE REVIEW OF SHOP DRAWINGS DOES NOT IMPLY ANY CHANGE IN ANY OTHER CONSULTANTS' OR PROFESSIONALS' RESPONSIBILITY RELATED TO DESIGN OF SPECIFIC ITEMS AS OUTLINED BY THE SPECIFICATIONS (SUCH AS STRUCTURAL STEEL CONNECTIONS, STEEL JOISTS, PRECAST ELEMENTS, ETC.). AFTER REVIEW, THE DRAWINGS WILL BE STAMPED AND RETURNED TO SHOW ONE OF THE FOLLOWING:

NOT REVIEWED	SHOWS WORK WHICH IS NOT WITHIN THE SCOPE OF STRUCTURAL CONSULTING SERVICES.
REVIEWED	NO DEVIATIONS FROM THE CONTRACT DOCUMENTS NOTED.
NOTED	WE HAVE MADE COMMENTS TO BE REVIEWED / INCORPORATED. SUBMIT RECORD PRINT.
RESUBMIT	REVISE AND RE-SUBMIT FOR REVIEW.

D. MATERIALS

1. PROVIDE ONLY NEW STRUCTURAL MATERIALS IN ACCORDANCE WITH THE REFERENCE STANDARDS AND THE FOLLOWING, UNLESS OTHERWISE NOTED.
- 1.1. CONCRETE:
- 1.1.1. CONCRETE STRENGTHS FOR STRUCTURAL ELEMENTS SHALL BE AS PER TABLE BELOW, UNLESS NOTED OTHERWISE ON PLANS, SCHEDULES, AND/OR SECTIONS.

TABLE D.1: CONCRETE STRENGTHS

STRUCTURAL ELEMENT AND EXPOSURE	EXPOSURE CLASS PER CSA A23.1	CONCRETE STRENGTH f'c (MPa)	SLUMP (mm)	MAX W/C RATIO	AIR CONTENT
FOOTING AND CAPS		25	80		
FOUNDATION WALLS	C-1	35	80	0.40	5% - 8%
SLAB-ON-GRADE	C-2	32	60	0.45	5% - 8%

TOLERANCE FOR SLUMP SHALL BE ± 20 mm FOR SPECIFIED SLUMP LESS THAN 80 mm, AND ± 30 mm FOR SPECIFIED SLUMP BETWEEN 80 mm AND 170 mm.

- \* SPECIAL CONCRETE HANDLING AND PLACING METHODS, OR THE USE OF A SUPER PLASTICIZER, WILL BE REQUIRED TO PLACE THIS CONCRETE. FINAL PLASTICIZED SLUMP SHALL BE ± 125 mm.
- \*\* WHERE AGGREGATES SMALLER THAN 14 mm ARE USED, INCREASE AIR CONTENT BY 1%.
- \*\*\* CONCRETE EXPOSED TO DE-ICING CHEMICALS SHALL HAVE DCI TYPE N CORROSION INHIBITOR AT 18 L/m<sup>3</sup> DOSAGE (MINIMUM) OR APPROVED EQUIVALENT.
- 1.2. REINFORCING STEEL: CONFORM TO CSA G30 SERIES, GRADE 400.
- 1.3. WELDED WIRE FABRIC: CONFORM TO CSA G30 SERIES, GRADE 386, IN FLAT SHEETS.
- 1.4. STRUCTURAL STEEL:
- 1.4.1. STRUCTURAL WIDE FLANGE (W) AND WELDED WIDE FLANGE SHAPES (WWF) TO CONFORM TO CAN/CSA G40.20/G40.21 GRADE 350W.
- 1.4.2. ANGLES (L), CHANNELS (C), AND PLATES TO CONFORM TO CAN/CSA-G40.20/G40.21 GRADE 300W.
- 1.4.3. HOLLOW STRUCTURAL SECTIONS (HSS) TO CONFORM TO ASTM A500 GRADE C.

- 1.5. PRIME PAINT: CONFORM TO CISC/CPMA STANDARD 2-75.
- 1.6. HOT DIP GALVANIZING: CONFORM TO CSA-G164, MINIMUM ZINC COATING OF 600 g/m<sup>2</sup>.
- 1.7. STRUCTURAL BOLTS, NUTS, AND WASHERS: CONFORM TO ASTM A325M.
- 1.8. ANCHOR RODS: CONFORM TO THE REQUIREMENTS OF ASTM F1554 GRADE 55.
- 1.9. NON-SHRINK GROUT = COMPRESSIVE STRENGTH OF 35 MPa AT 24 HOURS.
- 1.10. SAWN LUMBER: SPRUCE-PINE-FIR (SPF), No. 2 GRADE OR BETTER UNLESS NOTED ON DRAWINGS. CONFORM TO CSA O141.
- 1.11. PLYWOOD: CONFORM TO CSA O121 (DOUGLAS FIR PLYWOOD).

E. EXECUTION

1. FOUNDATIONS

- 1.1. FOUND ALL FOOTINGS (AND UNDERPINNING) ON SOIL CAPABLE OF SUSTAINING A MINIMUM ULTIMATE LIMIT STATES / SERVICE LIMIT STATES BEARING STRESS (ULS/SLS) OF 150 kPa / 100 kPa.
- 1.2. FOUND ALL FOOTINGS WHICH WILL BE EXPOSED TO FROST ACTION IN THE COMPLETED BUILDING A MINIMUM OF 1200 mm (4'-0") BELOW FINISHED GRADE.
- 1.3. DO NOT EXCEED A RISE OF 7 IN A RUN OF 10 IN THE LINE OF SLOPE BETWEEN ADJACENT FOOTING EXCAVATIONS OR ALONG STEPPED FOOTINGS. FOR STEPPED FOOTINGS, USE STEPS NOT EXCEEDING 600 mm (2'-0") IN HEIGHT AND A MINIMUM OF 1200 mm (4'-0") IN LENGTH.
- 1.4. SOIL BEARING CAPACITY SPECIFIED MUST BE VERIFIED BY THE SOIL ENGINEER PRIOR TO THE PLACING OF FOOTINGS AND ANY NON-CONFORMANCE WITH THE SPECIFIED MINIMUM CAPACITIES MUST BE IMMEDIATELY REPORTED TO THE STRUCTURAL ENGINEERS.
- 1.5. FOOTING ELEVATIONS, IF SHOWN, ARE FOR PRICE ESTIMATING PURPOSES ONLY, ARE NOT FINAL, AND MAY VARY ACCORDING TO SITE CONDITIONS OR AS REQUIRED BY SERVICES. ALL FOOTINGS MUST BE TAKEN TO A BEARING LAYER APPROVED BY THE SOILS ENGINEER.
- 1.6. CONCRETE FORMWORK CONTRACTOR TO COORDINATE UNDERSIDE OF FOOTING ELEVATIONS WITH THE SITE GRADING PLAN TO ENSURE THE MINIMUM DEPTH BELOW GRADE IS MAINTAINED FOR FOOTINGS EXPOSED TO FROST ACTION UNLESS NOTED OTHERWISE ON PLAN.

2. SLAB ON GRADE

- 2.1. PLACE SLAB-ON-GRADE ON SUB-GRADE MATERIAL CAPABLE OF SUSTAINING A MINIMUM BEARING CAPACITY OF 25 kPa (500 psf) WITHOUT SETTLEMENT RELATIVE TO THE BUILDING FOOTINGS.
- 2.2. UNLESS OTHERWISE NOTED, PROVIDE IMMEDIATELY UNDER SLABS-ON-GRADE A MINIMUM OF 200 mm (8") OF COMPACTED (MTC) GRANULAR 'B' MATERIAL. COMPACTION TO ACHIEVE A MINIMUM OF 98% STANDARD PROCTOR MAXIMUM DRY DENSITY.

3. CONCRETE

- 3.1. CONSTRUCTION JOINTS FOR WALLS, SLABS, AND BEAMS NOT SHOWN ON THE DRAWINGS SHALL BE APPROVED BY THE STRUCTURAL CONSULTANT BEFORE CONSTRUCTION. GENERALLY, JOINTS IN SLABS SHALL BE AT RIGHT ANGLES TO THE SPANS, AT MID-SPAN IF POSSIBLE, AND BE CLEAR OF SUPPORTS AND POINT LOADS.
- 3.2. WHEN ATMOSPHERIC TEMPERATURE IS AT OR BELOW 5°C, OR WHEN THERE IS A POSSIBILITY OF IT FALLING TO THAT LIMIT, PLACE CONCRETE IN ACCORDANCE WITH THE REQUIREMENTS OF CAN/CSA A23.1 "COLD WEATHER CONCRETING" AND ACI 306 "RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING". WHEN ATMOSPHERIC TEMPERATURE IS AT OR ABOVE 27° C, PLACE CONCRETE IN ACCORDANCE WITH CAN/CSA A23.1 "HOT WEATHER CONCRETING" AND ACI 305 "RECOMMENDED PRACTICES FOR HOT WEATHER CONCRETING".
- 3.3. COVER FOR REINFORCING STEEL BARS IN CONCRETE SHALL BE AS PER BELOW, UNLESS NOTED OTHERWISE ON PLANS, SCHEDULES, AND/OR SECTIONS.

THE CONDITION WITH THE GREATER COVER REQUIREMENT SHALL GOVERN:

- \* ALL CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH TO EARTH OR ROCK:
- ≤ 35M = 75 mm
- \*\* CONCRETE EXPOSED TO CHLORIDES (C-1, C-3) [DOES NOT INCLUDE CONCRETE PROTECTED BY A WATERPROOFING MEMBRANE]:
- ≤ 30M = 60 mm
- \*\*\* EXPOSED TO EARTH AND WEATHER (F-1, F-2):
- ≤ 25M = 40 mm

4. STRUCTURAL STEEL

- 4.1. PAINT ALL STRUCTURAL STEEL TO REQUIREMENTS OF CISC/CPMA 2-75. TOUCH UP ALL FIELD WELDS.
- 4.2. ALL STRUCTURAL STEEL EXPOSED TO WEATHER SHALL BE GALVANIZED IN ACCORDANCE WITH CSA G164.
- 4.3. ALL WELDS SHALL CONFORM TO CSA STANDARD W59.
- 4.4. ALL WELDS EXPOSED TO VIEW SHALL BE GROUND SMOOTH.

- 4.5. ANY ORGANIZATION UNDERTAKING TO WELD UNDER THIS CONTRACT SHALL BE CERTIFIED BY THE CANADIAN WELDING BUREAU UNDER REQUIREMENTS OF DIVISION 1 OR DIVISION 2.1 OF W47.1.
- 4.6. DO NOT SPLICE STRUCTURAL STEEL SECTIONS WITHOUT PRIOR APPROVAL OF THE CONSULTANT. ALL SPLICES SHALL DEVELOP THE FULL CAPACITY OF THE SECTION AND ARE TO BE TESTED BY NON DESTRUCTIVE METHODS, BY AN INDEPENDENT INSPECTION AND TESTING COMPANY, AT THE CONTRACTOR'S

EXPENSE.

- 4.7. FOR TIMBER CONSTRUCTION, TOP OF ALL STEEL BEAMS TO BE PRE-DRILLED TO ALLOW A 2x6 TIMBER NAILER TO BE INSTALLED. NAILER TO BE BOLTED WITH 13 mm (1/2") Ø BOLTS AT 1200 mm (4'-0") o/c, STAGGERED EACH SIDE.
- 4.8. COMPLETELY FILL VOIDS BENEATH STEEL BASES ON CONCRETE WITH AN APPROVED NON-SHRINK 36 MPa (5 ksi) GROUT.
- 4.9. SEE ARCHITECTURAL DRAWINGS FOR FIREPROOFING REQUIREMENTS. CONFIRM COMPATIBILITY OF FIREPROOFING MATERIAL WITH STEEL PAINT.
5. TIMBER FRAMING
- 5.1. ALL FRAMING, BRIDGING, NAILING, PROTECTION, HARDWARE AND OTHER FRAMING DETAILS ARE TO BE IN ACCORDANCE WITH PART 9 OF THE BUILDING CODE.
- 5.2. ROOF SHEATHING TO BE 16 mm (5/8") EXTERIOR GRADE FIR PLYWOOD NAILED AT 150 mm (6") o/c ALONG EDGES AND 300 mm (12") o/c ON INTERMEDIATE FRAMING MEMBERS. PROVIDE 3 mm (1/8") GAP BETWEEN SHEATHING PIECES.
- 5.3. WIND LOADS SHALL BE IN ACCORDANCE WITH THE ONTARIO BUILDING CODE. PROVIDE FRAMING ANCHORS TO RESIST UPLIFT AT EACH END OF EACH ROOF JOIST. ANCHORS TO HAVE A WORKING CAPACITY OF 0.5 kN (100 lbs).
- 5.4. UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS, THE CONTRACTOR SHALL PROVIDE STANDARD SIMPSON STRONG TIE HARDWARE OR APPROVED EQUIVALENT FOR ALL JOIST HANGERS, BEAM HANGERS, BEAM SEATS, POST ANCHORS, ETC.
- 5.5. MEMBERS SHALL BE ALIGNED LEVEL AND PLUMB, WITHIN A TOLERANCE OF 1 IN 500.
- 5.6. MAKE ADEQUATE PROVISIONS FOR ERECTION STRESSES AND FOR SUFFICIENT TEMPORARY BRACING TO KEEP THE STRUCTURAL FRAME PLUMB AND IN TRUE ALIGNMENT UNTIL THE COMPLETION OF THE ENTIRE FRAMING INCLUDING INSTALLATION OF THE FLOOR AND WALL SHEATHING.
- 5.7. FRAME AROUND ALL OPENINGS WITH DOUBLE HEADERS AND TRIMMERS NAILED TOGETHER WITH TWO ROWS OF 89 mm (3 1/2") SPIRAL NAILS AT 200 mm (8") o/c STAGGERED UNLESS NOTED OTHERWISE. DO NOT SPLICE MEMBERS BETWEEN SUPPORTS.
- 5.8. PROVIDE MINIMUM BEARING OF 38 mm (1 1/2") FOR ALL JOISTS.
- 5.9. PROVIDE MINIMUM BEARING OF 100 mm (4") FOR ALL BEAMS.
- 5.10. NO SAWN LUMBER SHALL BE NOTCHED OR DRILLED IN THE FIELD WITHOUT THE PERMISSION OF THE CONSULTANT.
- 5.11. ALL NAILERS TO BE ANCHORED WITH 13 mm (1/2") Ø ANCHOR BOLTS x 300 mm (12") LONG AT 1200 mm (4'-0") ON CENTRES. STAGGER ANCHOR BOLTS.

6. ALTERATIONS AND/OR CONNECTIONS TO EXISTING STRUCTURE

- 6.1. INSPECT THE EXISTING BUILDING AND BECOME THOROUGHLY FAMILIAR WITH THE EXISTING CONDITIONS.
- 6.2. PRIOR TO PROCEEDING WITH THE WORK, DETERMINE THE EXACT FOUNDING ELEVATIONS OF EXISTING FOOTINGS ADJACENT TO THE NEW WORK. REPORT THESE FINDINGS TO THE CONSULTANT.
- 6.3. PRIOR TO FABRICATION OF STRUCTURAL STEEL, OPEN UP ALL AREAS WHERE CONNECTIONS ARE TO BE MADE TO EXISTING WORK AND TAKE FIELD MEASUREMENTS. MODIFY METHODS FOR CONNECTING TO SUIT SITE CONDITIONS FOUND AND TO THE APPROVAL OF THE CONSULTANT. CARRY OUT LOCAL REPAIRS TO THE EXISTING WORK AS NECESSARY AND AS DIRECTED BY THE CONSULTANT.
- 6.4. SHORE EXISTING WORK AS REQUIRED UNTIL ALL NEW WORK HAS BEEN COMPLETED AND REVIEWED BY THE CONSULTANT.
- 6.5. PROVIDE SLOTTED HOLES AND FRICTION TYPE BOLTED CONNECTIONS TO CONNECT NEW STEEL TO EXISTING WORK.
- 6.6. MAKE GOOD THE EXISTING WORK.

F. QUALITY CONTROL

1. GENERAL

- 1.1. IMPLEMENT A SYSTEM OF QUALITY CONTROL TO ENSURE THAT THE MINIMUM STANDARDS SPECIFIED HEREIN ARE ATTAINED.
- 1.2. BRING TO THE ATTENTION OF THE CONSULTANT ANY DEFECTS IN THE WORK OR DEPARTURES FROM THE CONTRACT DOCUMENTS, WHICH MAY OCCUR DURING CONSTRUCTION. THE CONSULTANT WILL DECIDE UPON CORRECTIVE ACTION AND GIVE RECOMMENDATIONS IN WRITING.
- 1.3. THE CONSULTANT'S GENERAL REVIEW DURING CONSTRUCTION AND INSPECTION AND TESTING BY INDEPENDENT INSPECTION AND TESTING AGENCIES REPORTING TO THE CONSULTANT ARE BOTH UNDERTAKEN TO INFORM THE OWNER / CLIENT OF THE CONTRACTOR'S PERFORMANCE AND SHALL IN NO WAY AUGMENT THE CONTRACTOR'S QUALITY CONTROL OR RELIEVE THE CONTRACTOR OF CONTRACTUAL RESPONSIBILITY.

2. NOTIFICATION

- 2.1. PRIOR TO COMMENCING SIGNIFICANT SEGMENTS OF THE WORK, GIVE THE CONSULTANT AND INDEPENDENT INSPECTION AND TESTING COMPANIES APPROPRIATE NOTIFICATION (MINIMUM 24 HOURS) SO AS TO AFFORD THEM REASONABLE OPPORTUNITY TO REVIEW THE WORK. FAILURE TO MEET THIS REQUIREMENT MAY BE CAUSE FOR THE CONSULTANT TO CLASSIFY THE WORK AS DEFECTIVE.

3. INSPECTION AND TESTING

- 3.1. AN INDEPENDENT INSPECTION AND TESTING COMPANY SHALL MAKE INSPECTIONS OR PERFORM TESTS AS THE CONSULTANT DIRECTS. THE INDEPENDENT INSPECTION AND TESTING COMPANIES SHALL BE RESPONSIBLE ONLY TO THE CONSULTANT AND SHALL MAKE ONLY SUCH INSPECTIONS OR TESTS AS THE CONSULTANT MAY DIRECT.
- 3.2. THE FOLLOWING ITEMS REQUIRE TESTING AND/OR INSPECTION BY A CERTIFIED, INDEPENDENT INSPECTION AND TESTING COMPANY UNLESS OTHERWISE NOTED. THE TESTING FIRM SHALL SUBMIT COPIES OF ALL STRUCTURAL TESTING AND INSPECTION REPORTS TO THE CONSULTANT FOR REVIEW:

TABLE F.1: INSPECTION AND TESTING REQUIREMENTS

ITEM	REQUIRED	COMMENTS
SOIL BEARING CAPACITY	YES	BY GEOTECHNICAL CONSULTANT.
STRUCTURAL STEEL ERECTION	YES	REVIEW MEMBER SIZE, PLUMPNESS, BOLTED, CONNECTIONS, ETC.
STRUCTURAL STEEL WELDING	YES	VISUALLY INSPECT ALL FIELD WELDING.

4. DEFECTIVE MATERIALS AND WORK

- 4.1. WHERE EVIDENCE EXISTS THAT DEFECTIVE WORK HAS OCCURRED OR THAT WORK HAS BEEN CARRIED OUT INCORPORATING DEFECTIVE MATERIALS, THE CONSULTANT MAY HAVE TESTS, INSPECTIONS OR SURVEYS PERFORMED, ANALYTICAL CALCULATIONS OF STRUCTURAL STRENGTH MADE, AND THE LIKE, IN ORDER TO HELP DETERMINE WHETHER THE WORK MUST BE CORRECTED OR REPLACED. TESTS,

INSPECTIONS OR SURVEYS, OR CALCULATIONS CARRIED OUT UNDER THESE CIRCUMSTANCES WILL BE MADE AT THE CONTRACTOR'S EXPENSE, REGARDLESS OF THEIR RESULTS, WHICH MAY BE SUCH THAT, IN THE CONSULTANT'S OPINION, THE WORK MAY BE ACCEPTABLE.

- 4.2. ALL TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING CODE, EXCEPT WHERE THIS WOULD, IN THE CONSULTANT'S OPINION, CAUSE UNDUE DELAY OR GIVE RESULTS NOT REPRESENTATIVE OF THE REJECTED MATERIAL IN PLACE. IN THIS CASE, THE TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE STANDARDS GIVEN BY THE CONSULTANT.
- 4.3. MATERIALS OR WORK, WHICH FAIL TO MEET SPECIFIED REQUIREMENTS, MAY BE REJECTED BY THE CONSULTANT WHENEVER FOUND AT ANY TIME PRIOR TO FINAL ACCEPTANCE OF THE WORK REGARDLESS OF PREVIOUS INSPECTION. IF REJECTED, DEFECTIVE MATERIALS OR WORK SHALL BE PROMPTLY REMOVED AND REPLACED OR REPAIRED TO THE SATISFACTION OF THE CONSULTANT, AT NO EXPENSE TO THE OWNER.

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Project No. 24-1333

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NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2025/01/16
02	ISSUED FOR TENDER	2025/04/04



TENDER

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PROJECT INFORMATION: KELSO ARRIVAL CENTRE  
5234 KELSO ROAD  
MILTON, ON L9E 0C6

LIST OF STRUCTURAL DRAWINGS

SHEET No. SHEET TITLE

- S101 GENERAL NOTES
- S102 PROJECT NOTES AND TYPICAL DETAILS
- S103 TYPICAL DETAILS

DRAWING TITLE  
GENERAL NOTES

PROJECT NO.: 24--5162  
DATE: 2025/01/16  
SCALE: N/A

DRAWN BY: JRP  
REVIEWED BY: CN/ANG/NIS

S1 01



PROJECT DESIGN NOTES			
LOCATION		MILTON	
BUILDING IMPORTANCE CATEGORY		NORMAL	
IMPORTANCE FACTOR	SNOW	$I_{US,S} = 1.0$	$I_{SLS,S} = 0.9$
	WIND	$I_{US,S} = 1.0$	$I_{SLS,S} = 0.75$
	SEISMIC	$I_{US,S} = 1.0$	$I_{SLS,S} = 1.0$
FLOOR LOADS			
FLOOR LOADING		REFER TO PLAN NOTES	
CLADDING		LIMESTONE VENEER	2.25 kPa + WALL ASSEMBLY
CONCENTRATED LOADING			
AREA OF FLOOR / ROOF		MINIMUM SPECIFIED CONCENTRATED LOAD	LOADED AREA
ROOF SURFACES		1.3 kPa	200 mm x 200 mm
SPECIFIED SNOW AND RAIN LOADS ON ROOF			
SNOW AND RAIN LOADING (1/50)	$S_s$	1.3 kPa	
	$S_r$	0.4 kPa	
ADDITIONAL ACCUMULATION OF SNOW DUE TO ADJACENT HIGHER ROOFS, MECHANICAL UNITS, OTHER CONSTRUCTIONS, ROOF SHAPES / SLOPES, ETC., ARE INDICATED ON PLANS WHERE APPLICABLE.			
24 HOUR RAINFALL		125 mm OVER ENTIRE ROOF AREA	
DESIGN OF ROOF STRUCTURE IS BASED ON THE USE OF CONTROL FLOW ROOF DRAINS WHICH SATISFY ALL REQUIREMENTS OF THE NATIONAL PLUMBING CODE. THE DISTRIBUTION OF RAIN LOAD HAS BEEN MODIFIED TO ACCOUNT FOR THE ACTUAL ROOF SLOPES AND PROFILE.			
SEISMIC LOADS			
SEISMIC CATEGORY		SC2	
ANALYSIS METHOD		EQUIVALENT STATIC FORCE PROCEDURE	
SEISMIC HAZARD INDEX ( $I_E F_a S_a(0.2)$ )		0.331	
DESIGN GROUND MOTION DATA			
$S_a(0.2, X_c)$	0.331	PGA	0.206
$S_a(0.5, X_c)$	0.291	PGV	0.186
$S_a(1.0, X_c)$	0.168	$T_a(NORTH - SOUTH)$	0.10
$S_a(2.0, X_c)$	0.0788	$T_a(EAST - WEST)$	0.10
$S_a(5.0, X_c)$	0.0205	LATITUDE	45.505
$S_a(10.0, X_c)$	0.00639	LONGITUDE	- 79.945
SITE CLASS	CLASS D	AVG SHEAR WAVE VELOCITY, $V_{30}$	N/A
SEISMIC FORCE RESISTING SYSTEM (SFRS)	NORTH - SOUTH DIRECTION CONVENTIONAL CONSTRUCTION OF BRACED FRAMES	DUCTILITY FACTOR, $R_d$	1.5
		OVER-STRENGTH FACTOR, $R_o$	1.3
	EAST - WEST DIRECTION CONVENTIONAL CONSTRUCTION OF BRACED FRAMES	DUCTILITY FACTOR, $R_d$	1.5
		OVER-STRENGTH FACTOR, $R_o$	1.3
WIND LOADS			
WIND PRESSURE ( $q/50$ )		0.43 kPa	
ANALYSIS METHOD		STATIC PROCEDURE	
WIND DESIGN CATEGORY		CATEGORY 2	
TERRAIN TYPE		OPEN	
TOPOGRAPHIC FACTOR		$C_t$	1.0
WIND UPLIFT		ROOF ELEMENTS SUCH AS ROOF DECK, TRUSSES, JOISTS, BEAMS, ETC., AND THEIR CONNECTIONS ARE DESIGNED FOR UPLIFT PRESSURE DUE TO WIND AS PER THE KEY PLAN SHOWN ON TYPICAL TD-G02.	
$C_p$ AND $C_g$ ARE BASED ON FIGURE 4.1.7.6.A OF THE BUILDING CODE.			
LATERAL LOADS			
THE STRUCTURE HAS BEEN DESIGNED TO RESIST THE WORST CASE LOADING DUE TO WIND AND SEISMIC ACTIVITY AS PER THE REQUIREMENTS OF THE BUILDING CODE. MAXIMUM DESIGN BASE SHEARS ARE AS FOLLOWS:			
LATERAL FORCE		DIRECTION	SHEAR
DESIGN BASE SHEAR DUE TO WIND, $V$	NORTH - SOUTH		40 kN
	EAST - WEST		15 kN
DESIGN BASE SHEAR DUE TO SEISMIC FORCES, $V$	NORTH - SOUTH		60 kN
	EAST - WEST		60 kN
NOTES			
1. THE STRUCTURE HAS BEEN (STRUCTURAL ALTERATIONS HAVE BEEN) DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING CODE.			
2. STRUCTURAL STEEL AND OPEN WEB STEEL JOIST ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CAN/CSA S16, LIMITS STATES DESIGN OF STRUCTURAL STEEL.			
3. REINFORCING CONCRETE ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CSA A23.3, DESIGN OF CONCRETE STRUCTURES.			
4. STRUCTURAL TIMBER ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CSA O86, ENGINEERED DESIGN IN WOOD (LIMIT STATES DESIGN).			
5. LOAD BEARING MASONRY ELEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CSA STANDARD CAN-S304, DESIGN FOR MASONRY STRUCTURES.			
6. COLD FORMED STRUCTURAL STEEL ELEMENTS ARE DESIGNED IN ACCORDANCE WITH S136, COLD FORMED STEEL STRUCTURAL MEMBERS.			
7. ALL CODES, MANUALS, STANDARDS, AND SPECIFICATIONS REFERRED TO SHALL BE THE LATEST EDITIONS INCLUDING ALL REVISIONS AND ADDENDA AS REFERENCED IN THE BUILDING CODE.			

STRUCTURAL ABBREVIATIONS				TD-G01
A BOLT	ANCHOR BOLT	$f_c$	28 DAYS CONCRETE COMPRESSIVE STRENGTH	OF OUTSIDE FACE OPENING
ADJ	ADJUSTABLE	FDN	FOUNDATION	OPEN WEB STEEL JOIST
AFF	ABOVE FINISHED FLOOR	FF	FAR FACE	AXIAL FORCE (FACTORED)
AFB	ASPHALT IMPREGNATED FIBREBOARD	FIN	FINISHED FLOOR	PC PRECAST PLATE
ALT	ALTERNATE	FL	FOOT, FEET	PLF POUNDS PER LINEAR FOOT
ARCH	ARCHITECTURAL	FTG	FOOTING	PROJ PROJECTION
ASL	ADDITIONAL ACCUMULATED SNOW LOAD	Fy	YIELD STRENGTH	PSF POUNDS PER SQUARE FOOT
@	AT	GA	GAUGE	PT PRESSURE TREATED
B, BOTT	BOTTOM	GALV	GALVANIZED	RD ROOF DRAIN
B/B	BACK TO BACK	GEN	GENERAL	RF REACTION (FACTORED)
BEW	BOTTOM EACH WAY	HEF	HORIZONTAL EACH FACE	RAD RADIUS
BH	BOREHOLE	Hf	HORIZONTAL FORCE (FACTORED)	REINF REINFORCED, REINFORCEMENT
BL	BOTTOM LOWER LAYER	HH	HOOK EACH END	REF REFERENCE
BLDG	BUILDING	HIF	HORIZONTAL INSIDE FACE	RE RIGHT END
BM	BEAM	HOF	HORIZONTAL OUTSIDE FACE	REQ'D REQUIRED
BPL	BEARING/BASE PLATE	H, HORZ	HORIZONTAL	REV REVISION; REVISED
BRDG	BRIDGING	HSC	HORIZONTALLY SLOTTED CONNECTION	R/W REINFORCED WITH
BUL	BOTTOM UPPER LAYER	HSS	HOLLOW STEEL SECTION	SAD SEE ARCHITECTURAL DRAWINGS
c	CAMBER	IF	INSIDE FACE	SDF STEP DOWN FOOTING
c	EPOXY COATED	IN	INCH(ES)	SECT SECTION
c/c, o/c	CENTRE TO CENTRE	INT	INTERIOR	SIM SIMILAR
CA	COLUMN ABOVE	JT	JOINT	SL SLAB
CB	COLUMN BELOW	K	KIP, 1000 LBS	SOG SLAB ON GRADE
CANT	CANTILEVER	K-ft	KIP FEET	SPDD STANDARD PROCTOR DRY DENSITY
Cf	COMPRESSIVE FORCE (FACTORED)	kg	KILOGRAM(S)	ST STRAIGHT
CJ	CONTROL JOINT	KLF	KIPS PER LINEAR FOOT	STIFF STIFFENER
CL	CENTRELINE	kN	KILONEWTON	STIR STIRRUP
COL	COLUMN	kN-m	KILONEWTON METRE	STRUCT STRUCTURAL
COMP	COMPOSITE	kN/m	KILONEWTON PER METRE	STD STANDARD
CONC	CONCRETE	kPa	KILOPASCAL	SQ SQUARE
CONT	CONTINUOUS	KSF	KIPS PER SQUARED FOOT	T TOP
C/W	COMPLETE WITH DEMOLITION	KSI	KIPS PER SQUARED INCH	TI TENSILE FORCE (FACTORED)
DET	DETAIL	L	SINGLE ANGLE	TEMP TEMPORARY, TEMPERATURE
DIA, Ø	DIAMETER	LE	LEFT END	TJ TIE JOIST
DIAG	DIAGONAL	LG	LONG	TLL TOP LOWER LAYER
DIM	DIMENSION	LLH	LONG LEG HORIZONTAL	T/M TORSIONAL MOMENT (FACTORED)
DL	DEAD LOAD	LLV	LONG LEG VERTICAL	TOD TOP OF DECK
DP	DEEP	LSH	LONG SIDE HORIZONTAL	TOS TOP OF STEEL/SLAB
DWG(S)	DRAWING(S)	LSV	LONG SIDE VERTICAL	TRANS TRANSVERSE
DWL(S)	DOWEL(S)	m	METRE	TUL TOP UPPER LAYER
DN	DOWN	MC	MOMENT CONNECTION	TYP TYPICAL
EA	EACH		(FULL MOMENT UNLESS NOTED)	UL UPPER LAYER
EE	EACH END	MECH	MECHANICAL	UN UNLESS NOTED OTHERWISE
EF	EACH FACE	Mf	MOMENT (FACTORED)	U/S UNDERSIDE
ELEC	ELECTRICAL	ML	MIDDLE LAYER	V, VERT VERTICAL
EL	ELEVATION	mm	MILLIMETRE	V, VERT VERTICAL SHEAR FORCE (FACTORED)
ELEV	ELEVATOR	MPa	MEGAPASCAL	VBF VERTICAL BRACED FRAME
EMBED	EMBEDMENT	Mxf	BENDING MOMENT	VEF VERTICAL EACH FACE
EQ	EQUAL		ABOUT x-x AXIS (FACTORED)	VIF VERTICAL INSIDE FACE
ES	EACH SIDE	Myf	BENDING MOMENT	VOF VERTICAL OUTSIDE FACE
EX, EXIST	EXISTING		ABOUT y-y AXIS (FACTORED)	VSC VERTICALLY SLOTTED CONNECTION
EJ, EXP JT	EXPANSION JOINT	NF	NEAR FACE	W WIDE FLANGE BEAM
E-W	EAST - WEST	NIC	NOT IN CONTRACT	WT WEIGHT, STRUCTURAL TEE
EW	EACH WAY	N-S	NORTH-SOUTH	WWF WELDED WIRE FABRIC OR WELDED WIDE FLANGE
EXT	EXTERIOR	NTS	NOT TO SCALE	W.P. WORKING POINT

FOOTINGS AND BASES FOR STEEL COLUMNS		TD-CF7
NOTES:		
1. WHERE RATIO OF CAP HEIGHT TO CAP WIDTH (H/W) EXCEEDS 3, PROVIDE 0.5% VERTICAL STEEL WITH 10M TIES @ THE LESSER OF 500 mm (1'-8") OR THE LEAST CAP DIMENSION (2 TIES MINIMUM).		
2. HEIGHT (H) OF CAP SHALL BE MINIMUM OF 2 x PROJECTION (A) BUT NOT LESS THAN 200 mm (8").		
3. SEE COLUMN SCHEDULE FOR ADDITIONAL REQUIREMENTS.		
4. MINIMUM FOUR (4) ANCHOR ROD SPECIFIED IN ACCORDANCE WITH CSA S16 CLAUSE 25.2 ERECTOR TO PROVIDE SPECIAL PRECAUTIONS IF LESS THAN FOUR ANCHORS INSTALLED.		

WIND UPLIFT DIAGRAM		TD-G02
FACTORED WIND UPLIFT DESIGN REQUIREMENTS		
ZONE	PREENGINEERED TIMBER TRUSSES	
	GENERAL	OVERHANG
1	0.47 kPa	0.94 kPa
2	0.96 kPa	0.94 kPa
3	1.24 kPa	0.72 kPa
NOTE:		
1. UPLIFT VALUES IN TABLE ARE BASED ON THE FACTORED LOAD COMBINATION 0.9 DEAD + 1.4 WIND.		

CONCRETE WALLS, PITS AND TRENCHES		TD-CF14
PIT AND TRENCH DETAILS		



NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2025/01/16
02	ISSUED FOR TENDER	2025/04/04



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PROJECT INFORMATION: KESLO ARRIVAL CENTRE  
5234 KESLO ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE

TYPICAL DETAILS

PROJECT NO.: 24-5162

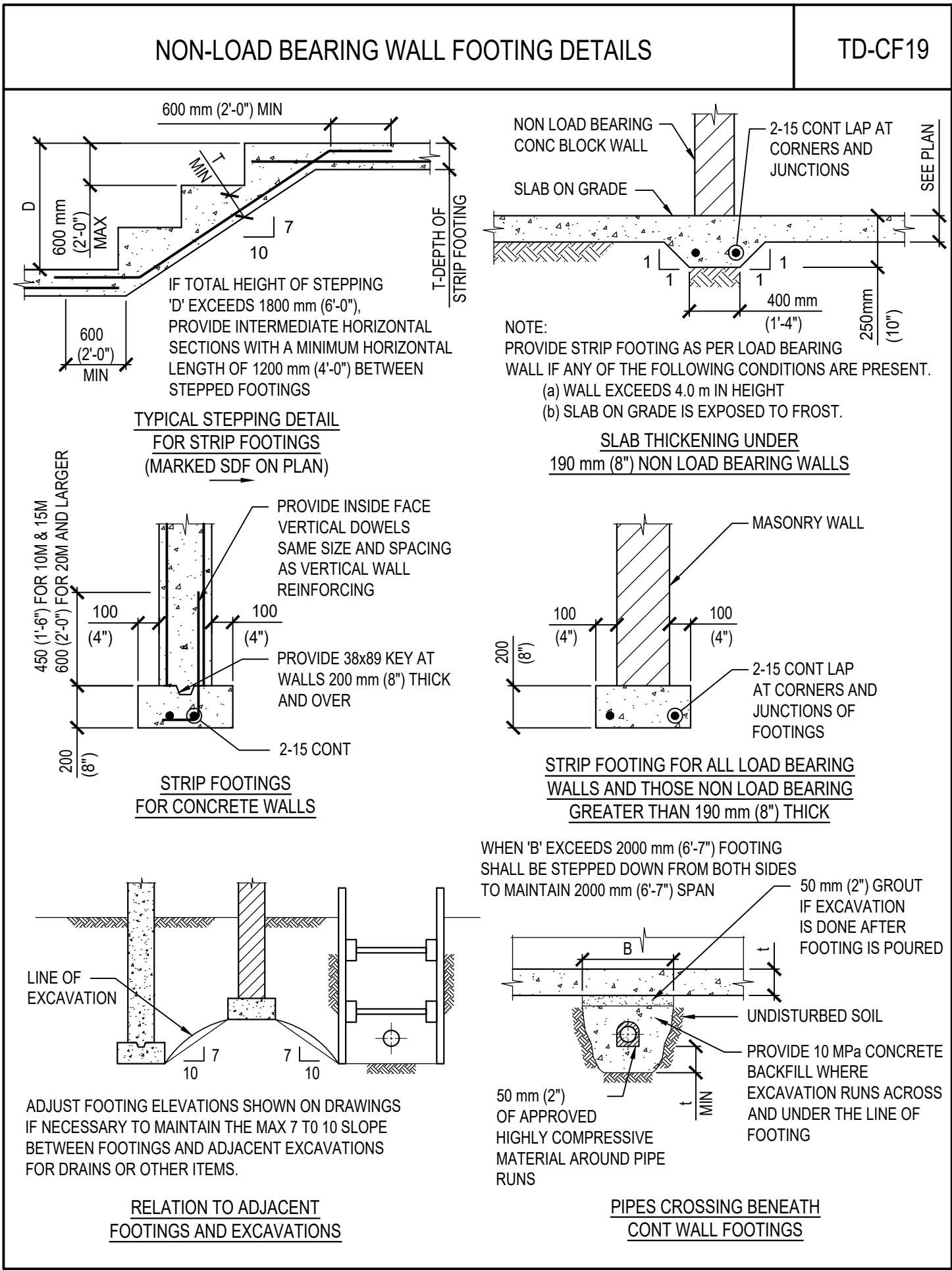
DATE: 2025/01/16

SCALE: NTS

DRAWN BY: JRP

REVIEWED BY: CN/ANG/NIS





STANDARD REINFORCING DEVELOPMENT & SPLICE LENGTHS  $f_y = 400 \text{ MPa}$  TD-CM1

TABLE A  
CLASS "B" BLACK BAR TENSION LAP SPLICE LENGTHS

$f_c$ (MPa)	BAR SIZE	10	15	20	25	30	35
20	560	840	1120	1750	2100	2450	
25	500	750	1000	1560	1880	2190	
30	460	690	920	1430	1710	2000	
35	430	640	850	1320	1590	1850	
40	400	600	790	1240	1480	1730	
45	390	560	750	1170	1400	1630	
50	390	530	710	1110	1330	1550	
55	390	510	680	1060	1270	1480	
60	390	490	650	1010	1210	1410	
64 TO 80	390	470	630	980	1170	1370	

TABLE B  
BLACK BAR CLASS "A" TENSION DEVELOPMENT LENGTH

$f_c$ (MPa)	BAR SIZE	10	15	20	25	30	35
20	330	490	650	1010	1210	1410	
25	300	440	580	900	1080	1260	
30	300	400	530	830	990	1160	
35	300	370	490	770	920	1070	
40	300	350	460	720	860	1000	
45	300	330	430	680	810	940	
50	300	310	410	640	770	900	
55	300	300	390	610	730	850	
60	300	300	380	590	700	820	
64 TO 80	300	300	360	570	680	790	

TABLE C  
BLACK BAR MINIMUM TENSION EMBEDMENT WITH STANDARD HOOKS

$f_c$ (MPa)	BAR SIZE	10	15	20	25	30	35
20	230	340	450	560	680	790	
25	200	300	400	500	600	700	
30	190	280	370	460	550	640	
35	170	260	340	430	510	600	
40	160	240	320	400	480	560	
45	150	230	300	380	450	530	
50	150	220	290	360	430	500	
55	150	210	270	340	410	480	
60	150	200	260	330	390	460	
64 TO 80	150	190	250	320	380	440	

TABLE D  
BLACK BAR COMPRESSION LAP SPLICE AND DEVELOPMENT LENGTHS

$f_c$ (MPa)	BAR SIZE	10	15	20	25	30	35
20	LAP SPLICE	300	440	590	730	880	1030
25	DEVELOPMENT	220	330	430	540	650	760
30	LAP SPLICE	300	440	590	730	880	1030
35	DEVELOPMENT	200	290	390	480	580	680
40	LAP SPLICE	300	440	590	730	880	1030
45	DEVELOPMENT	200	270	360	440	530	620
50	LAP SPLICE	300	440	590	730	880	1030
55	DEVELOPMENT	200	250	330	410	490	570
60	LAP SPLICE	300	440	590	730	880	1030
64 TO 80	DEVELOPMENT	200	230	310	380	460	540
20	LAP SPLICE	300	440	590	730	880	1030
25	DEVELOPMENT	200	220	290	360	430	510
30	LAP SPLICE	300	440	590	730	880	1030
35	DEVELOPMENT	200	210	280	340	410	480
40	LAP SPLICE	300	440	590	730	880	1030
45	DEVELOPMENT	200	200	260	330	390	460
50	LAP SPLICE	300	440	590	730	880	1030
55	DEVELOPMENT	200	200	250	310	380	440
60	LAP SPLICE	300	440	590	730	880	1030
64 TO 80	DEVELOPMENT	200	200	240	300	360	420

STANDARD REINFORCING DEVELOPMENT & SPLICE LENGTHS  $f_y = 400 \text{ MPa}$  TD-CM2

TABLE A  
BLACK BAR TENSION DEVELOPMENT LENGTH & TENSION LAP SPLICE LENGTHS CLASS "B"

$f_c$ (MPa)	BAR SIZE	10	15	20	25	30	35
20	420	630	840	1310	1570	1840	
25	380	570	750	1170	1410	1640	
30	350	520	690	1070	1290	1500	
35	320	480	640	990	1190	1390	
40	300	450	600	930	1110	1300	
45	300	420	560	880	1050	1230	
50	300	400	530	830	1000	1160	
55	300	380	510	790	950	1110	
60	300	370	490	760	910	1060	
64 TO 80	300	360	470	740	880	1030	

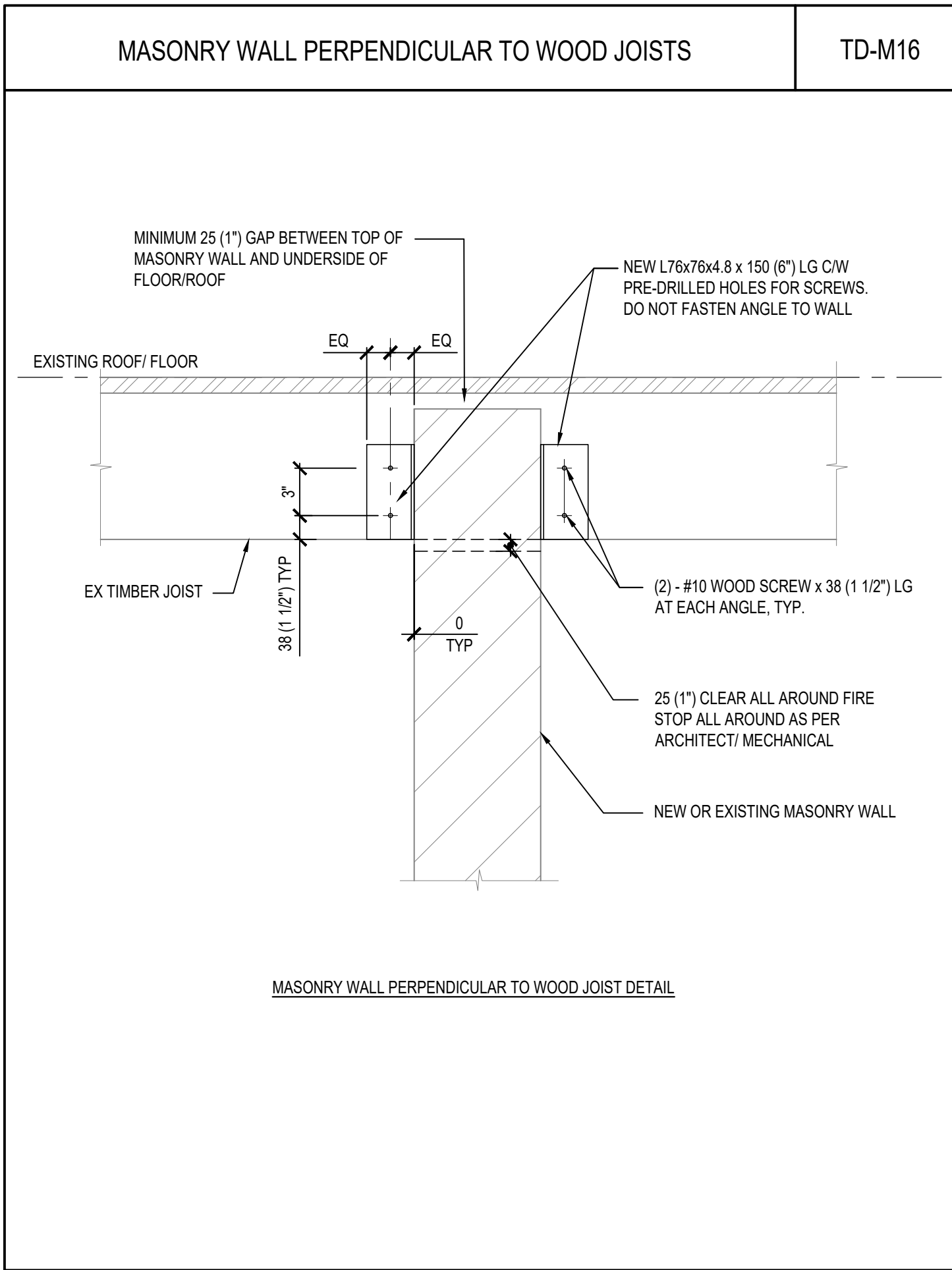
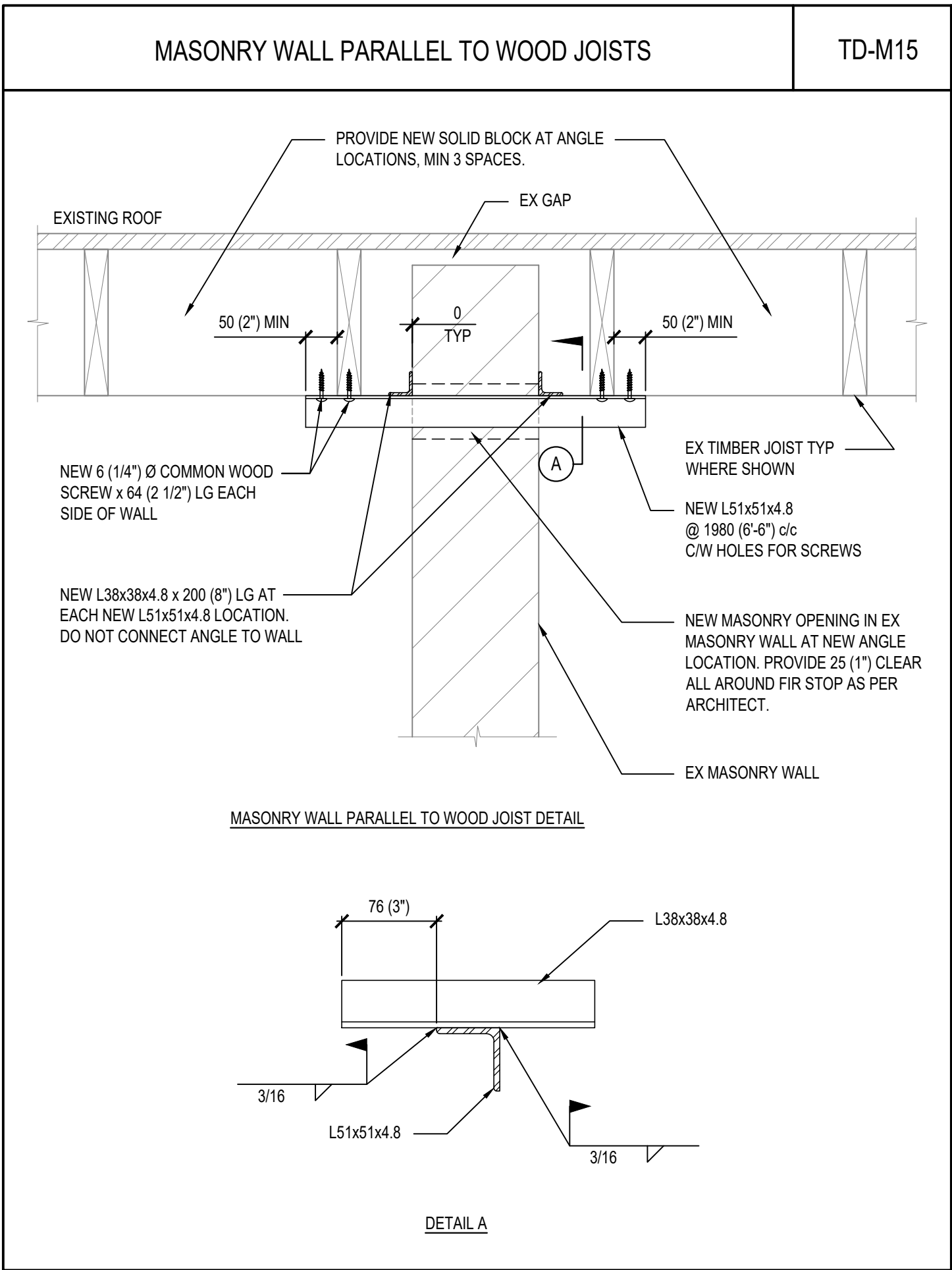
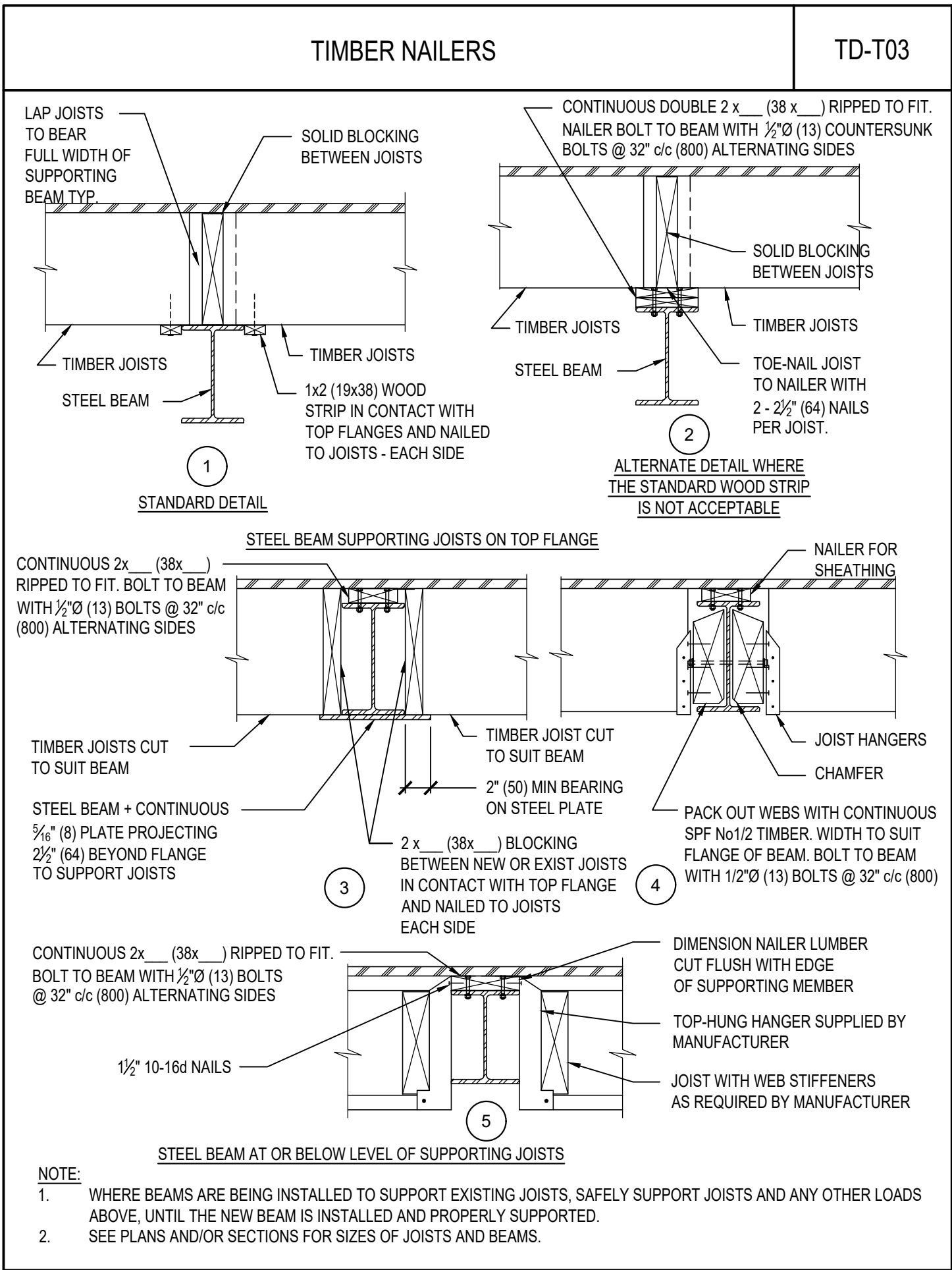
TABLE B  
BLACK BAR TENSION DEVELOPMENT LENGTH & TENSION LAP SPLICE LENGTHS CLASS "B", TOP BARS

$f_c$ (MPa)	BAR SIZE	10	15	20	25	30	35
20	550	820	1090	1710	2050	2390	
25	490	740	980	1530	1830	2130	
30	450	670	890	1390	1670	1950	
35	420	620	830	1290	1550	1800	
40	390	580	770	1210	1450	1690	
45	390	550	730	1140	1370	1590	
50	390	520	690	1080	1300	1510	
55	390	500	660	1030	1240	1440	
60	390	480	630	990	1180	1380	
64 TO 80	390	460	610	960	1150	1340	

TABLE C  
BLACK BAR TENSION DEVELOPMENT LENGTH & TENSION LAP SPLICE LENGTHS CLASS "B", TOP BARS

$f_c$ (MPa)	BAR SIZE	10	15	20	25	30	35
20	730	1090	1460	2270	2730	3180	
25	650	980	1300	2030	2440	2840	
30	600	890	1190	1860	2230	2600	
35	550	830	1100	1720	2060	2400	
40	520	770	1030	1610	1930	2250	
45	490	730	970	1520	1820	2120	
50	460	690	920	1440	1730	2010	
55	440	660	880	1370	1650	1920	
60	420	630	840	1310	1580	1840	
64 TO 80	410	610	820	1270	1530	1780	

NOTE:  
1. SEE TD-CM1 FOR ADDITIONAL NOTES.



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Project No. 24-1333

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NO.	DESCRIPTION	DATE
01	ISSUED FOR COORDINATION	2025/01/16
02	ISSUED FOR TENDER	2025/04/04



TENDER

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PROJECT INFORMATION: KESLO ARRIVAL CENTRE  
5234 KESLO ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE

TYPICAL DETAILS

PROJECT NO.: 24-5162

DATE: 2025/01/16

SCALE: NTS

DRAWN BY: JRP

REVIEWED BY: CN/ANG/NIS

S1 03



NO.	DESCRIPTION	DATE
01	ISSUED FOR PERMIT	2025/02/07
02	ISSUED FOR TENDER	2025/04/04



TENDER

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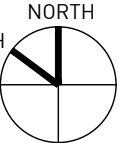
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PROJECT INFORMATION  
PROJECT: KELS0 ARRIVAL CENTRE  
5234 KELS0 ROAD  
MILTON, ON L9E 0C6



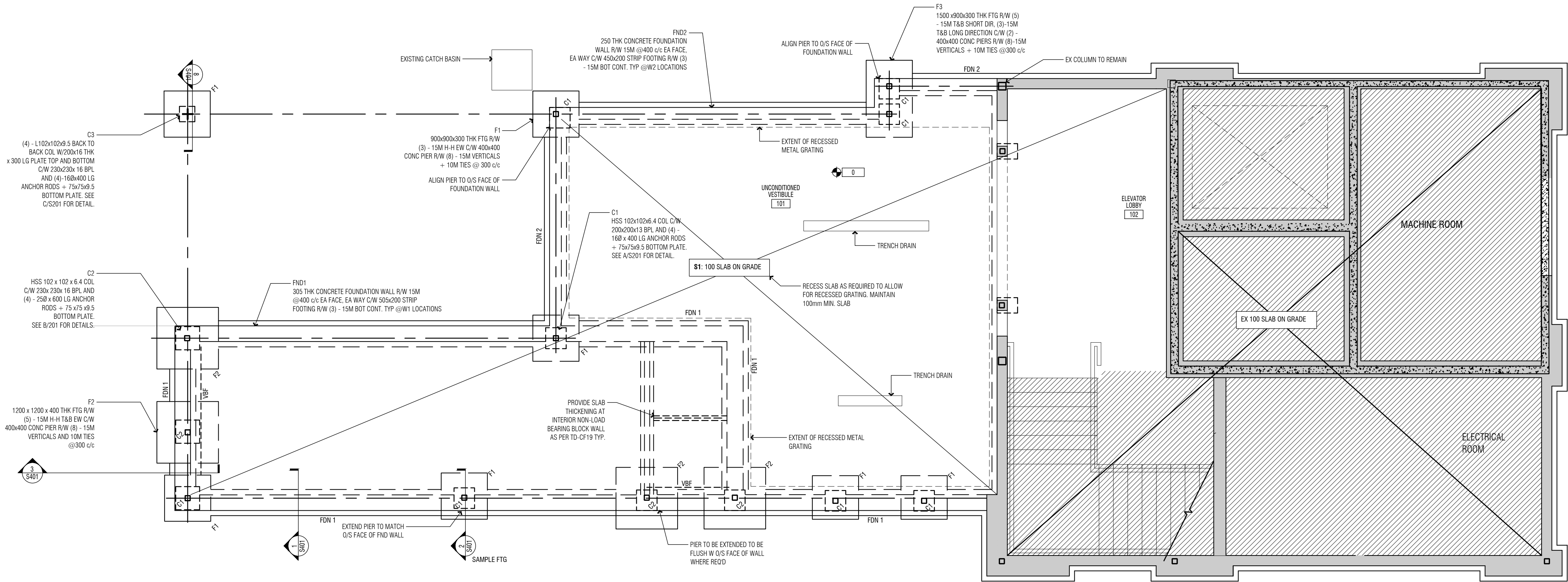
DRAWING TITLE  
PROPOSED FOUNDATION PLAN

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

DRAWN BY: DS  
REVIEWED BY: AS

S2

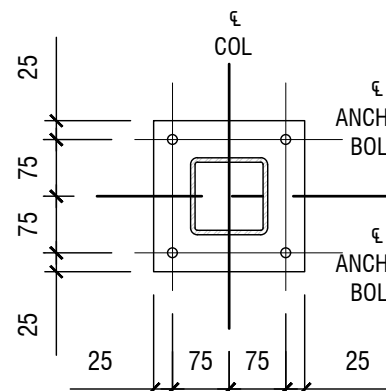
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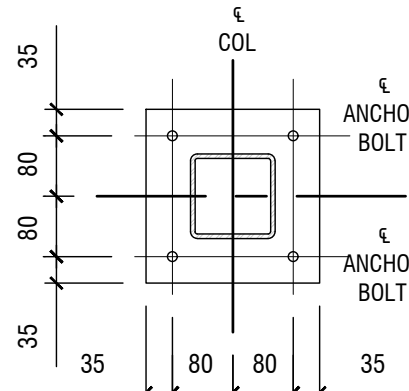
1 FOUNDATION PLAN  
S201 1:50

FOUNDATION PLAN NOTES

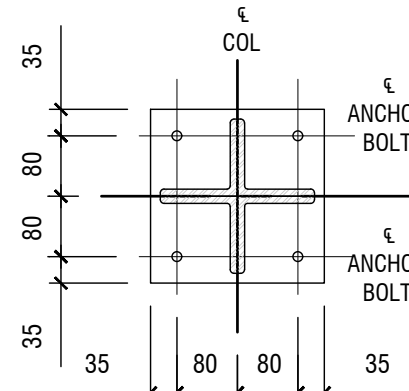
- TOP OF SLAB GRADE TO 0.0 BELOW FINISHED FLOOR ELEVATION 0.00m EXPECT AS CROSSED AND NOTED. AREAS CROSSED AND NOTED TO BE READ FROM GROUND FLOOR ELEVATION 0.00m.
- UNDERSIDE OF COLUMN FOOTINGS TO BE MINIMUM 1.20m BELOW GRADE UNLESS OTHERWISE NOTED.
- UNDERSIDE OF WALL FOOTINGS TO BE AT MINIMUM 1.20m BELOW GRADE UNLESS OTHERWISE NOTED.
- UNDERSIDE OF COLUMN BASEPLATES TO BE AT -0.20m BELOW TOP OF SLAB ON GRADE ELEVATION.
- UNLESS OTHERWISE NOTED, ALL WALL FOOTINGS ARE TO BE 200mm DEEP WITH 100mm PROJECTIONS EACH SIDE AND REINFORCED WITH 2-15B CONTINUOUS.
- UNLESS OTHERWISE NOTED, ALL WALL FOOTS ARE COINCIDENT UNLESS OTHERWISE NOTED. WHERE PIERS TO BE OFF CENTRE FROM COLUMNS, FOOTINGS ARE COINCIDENT WITH PIERS.
- PROVIDE SLAB DEPRESSIONS AND SLOPES, OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS, AS REQUIRED BY THE ARCHITECTURAL AND MECHANICAL DRAWINGS AND SPECIFICATIONS.
- SEE ARCHITETCURAL DRAWINGS FOR SLOPES TO DRAIN. MAINTAIN SLAB THICKNESSES SHOWN.
- REFER TO GENERAL NOTES FOR REQUIRED SOIL BEARING CAPACITY.
- GEOTECHNICAL ENGINEER TO INSPECT AND VERIFY ALL FOOTING BEARING CAPACITIES PRIOR TO STARTING THE WORK.



A C1 BPL  
S201 1:10



B C2 BPL  
S201 1:10



C C3 BPL  
S201 1:10



NO.	DESCRIPTION	DATE
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TENDER

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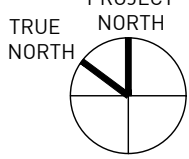
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PROJECT INFORMATION	KELSO ARRIVAL CENTRE
PROJECT	5234 KELSO ROAD
NORTH	MILTON, ON L9E 0C6



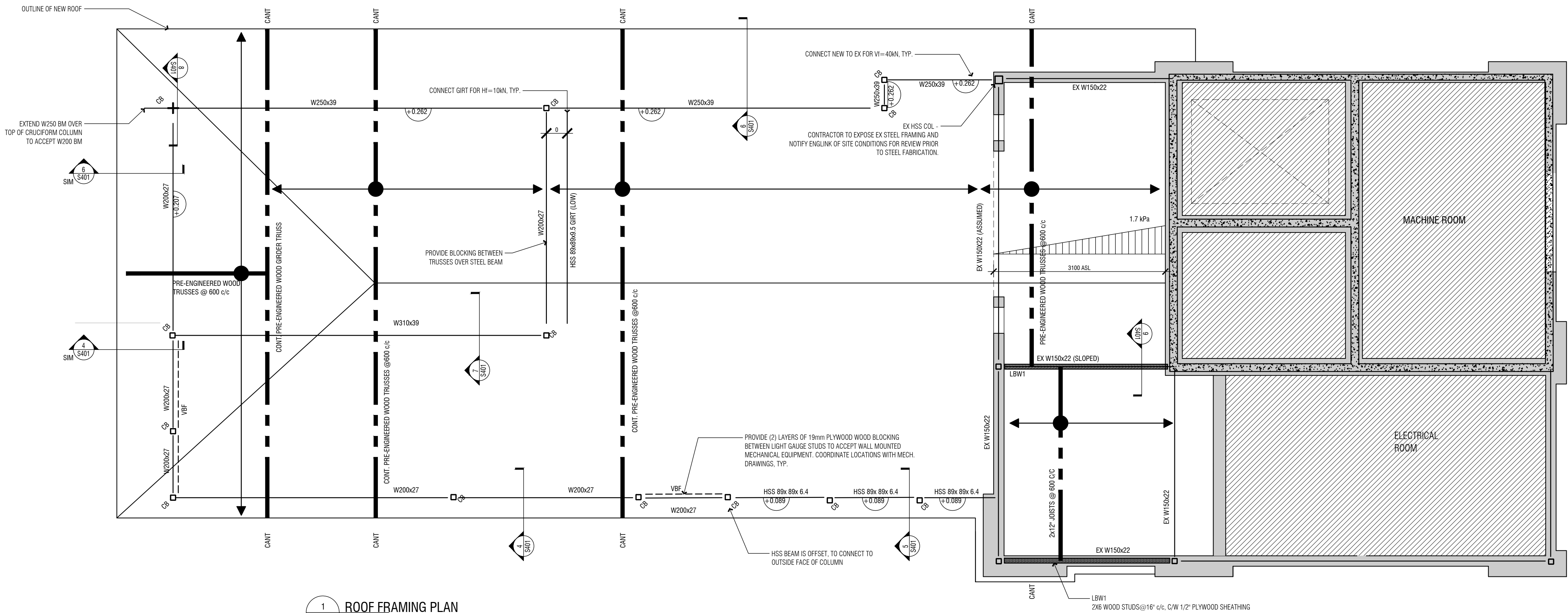
DRAWING TITLE  
ROOF FRAMING PLAN

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

DRAWN BY: DS  
REVIEWED BY: AS

S2

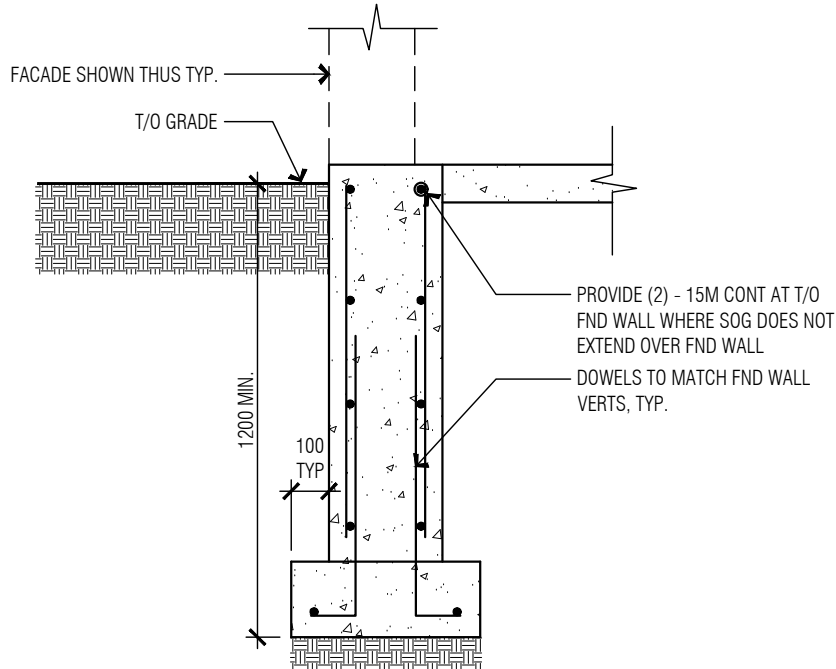
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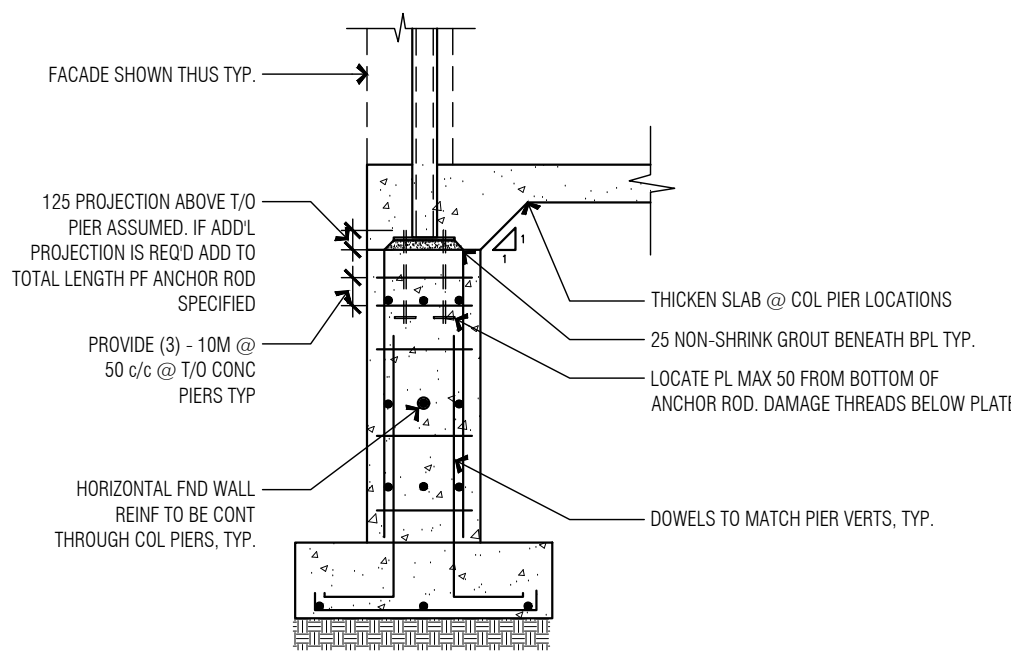
1 ROOF FRAMING PLAN  
S202 1:50

- ROOF FRAMING NOTES
- 1.TOP OF STEEL BEAMS ARE TO BE 0.038m BELOW U/S TRUSS BOTTOM CHORD ELEVATION. EXCEPT AS NOTED ON PLAN. BEAM ELEVATIONS NOTED ON PLAN ARE TO BE READ FROM U/S SOFFIT +3.960m.
  2. ALL STEEL BEAMS TO BE FITTED WITH 38x140 TOP FLANGE NAILERS. NAILERS TO BE ANCHORED WITH 12 DIAMETER ANCHOR BOLTS AT 1200 CENTRES. STAGGER ANCHORS BOLTS ABOUT BEAM WEB.
  - 3.READ DRAWING IN COMBINATION WITH GENERAL NOTES AND TYPICAL DETAILS.
  - 4.EXISTING STRUCTURE HAS BEEN CHECKED FOR NEW LOADS (INCL. WIND LOADS) AND WAS FOUND TO BE ACCEPTABLE.
  - 5.SNOW LOADS ARE: 1.44 kPa + ASL
  - 6.SUPERIMPOSED DEAD LOADS ARE:

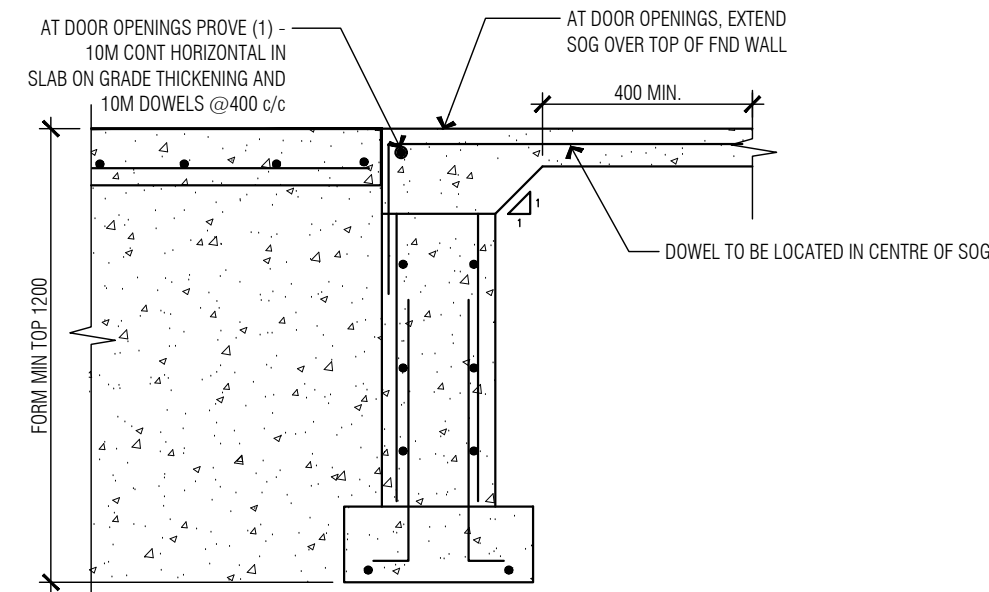
ROOFING	0.15 kPa
INSULATION	0.10 kPa
SHEATHING	0.10 kPa
SUSPENDED CEILING/ SOFFIT	0.15 kPa
MECHANICAL ALLOWANCE	0.20 kPa
  - 7.STEEL BEAM CONNECTIONS ARE TO BE DESIGNED FOR THE FACTORED FORCES INDICATED ON PLAN. WHERE NO FORCE IS INDICATED, DESIGN STEEL CONNECTIONS FOR A FACTORED VERTICAL SHEAR FORCE OF 150 kN. PROVIDE MINIMUM 2 BOLTS AT ALL CONNECTIONS.
  8. VERIFY ALL EXISTING FRAMING AT ONSET OF CONSTRUCTION AND NOTIFY CONSULTANTS OF DISCREPANCIES PRIOR TO PROCEEDING WITH WORK.
  - 9.SEE ARCHITECTURAL DRAWINGS FOR SLOPES ETC.



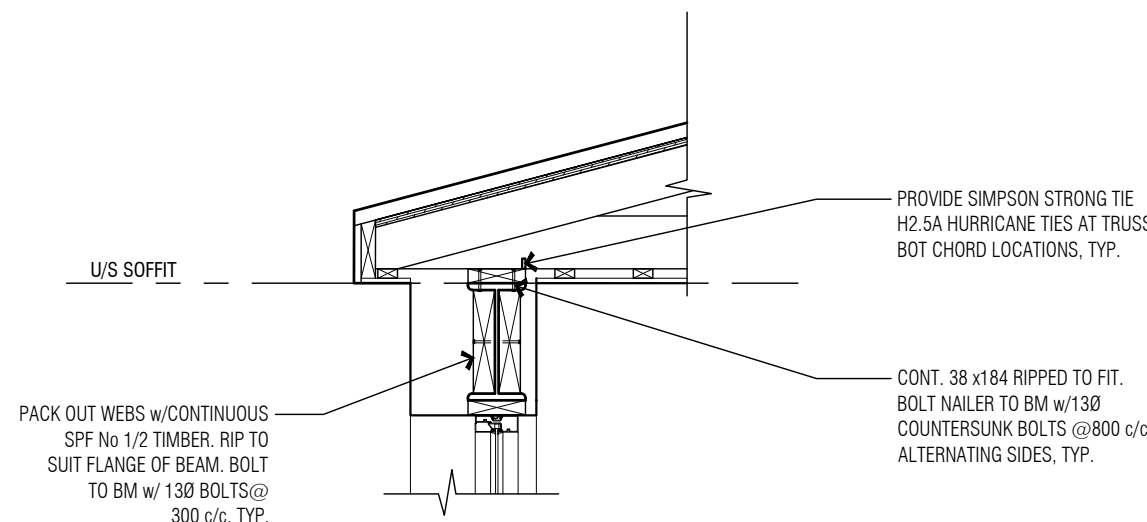
1 STRUCTURAL DETAIL  
S401 1:20



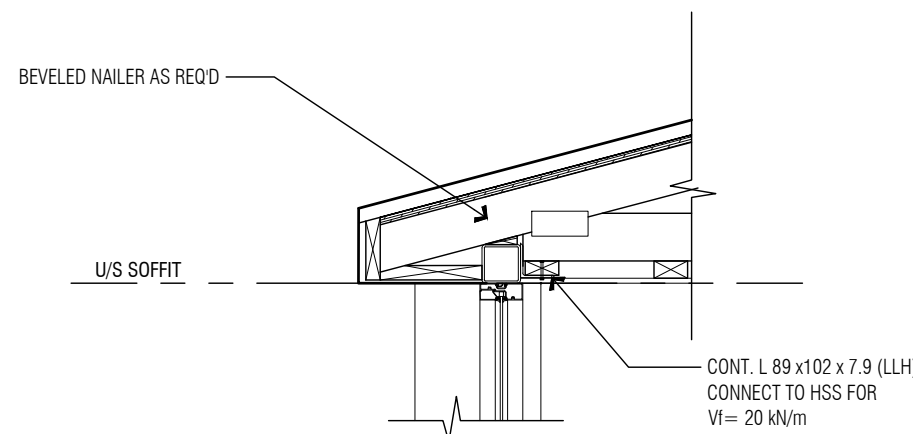
2 STRUCTURAL DETAIL  
S401 1:20



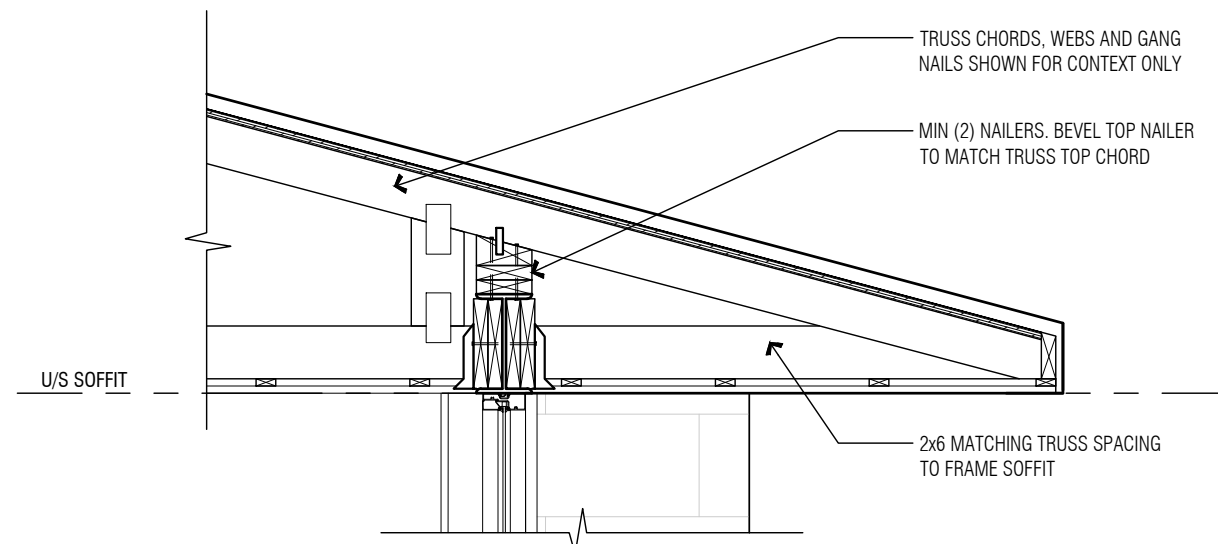
3 STRUCTURAL DETAIL  
S401 1:20



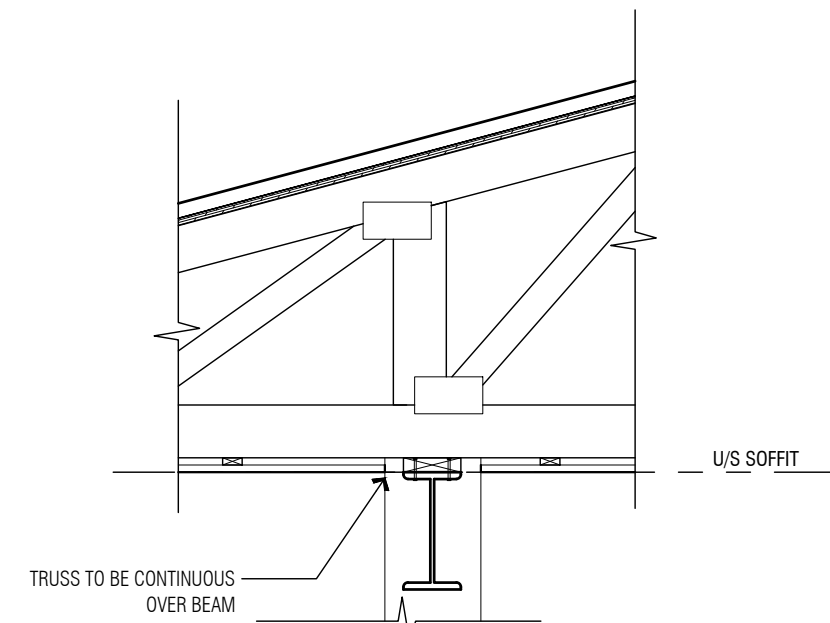
4 STRUCTURAL DETAIL  
S401 1:20



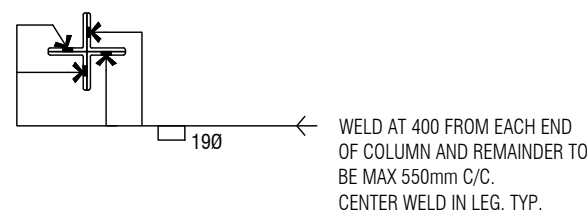
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S401 1:20



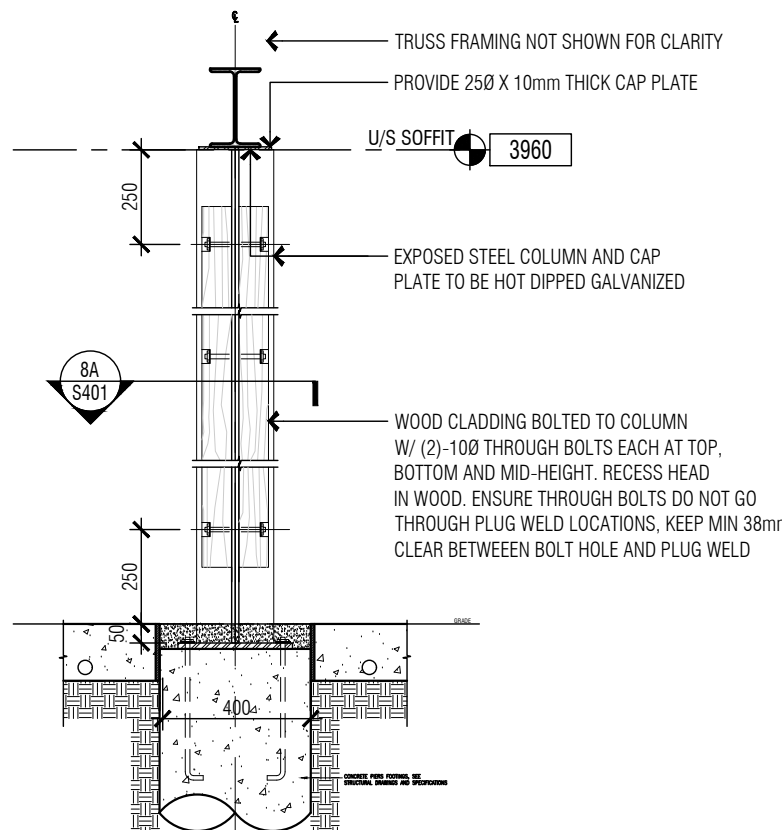
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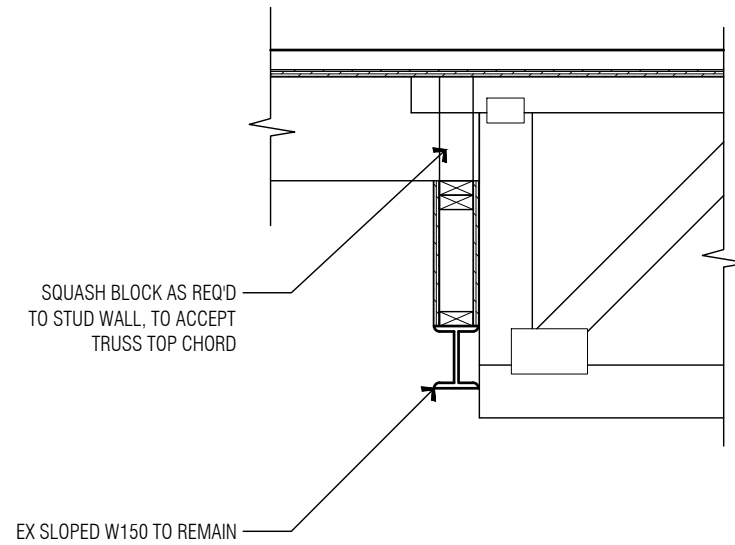
7 STRUCTURAL DETAIL  
S401 1:20



8A STRUCTURAL DETAIL  
S401 1:20



8 STRUCTURAL DETAIL  
S401 1:20



9 STRUCTURAL DETAIL  
S401 1:20

# RED

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Project No. 24-1333

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02	ISSUED FOR TENDER	2025/04/04



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PROJECT INFORMATION KELS0 ARRIVAL CENTRE  
5234 KELS0 ROAD  
MILTON, ON L9E 0C6

DRAWING TITLE  
STRUCTURAL DETAILS

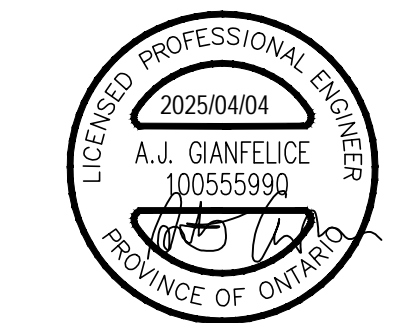
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# S4

# 01

NO.	DESCRIPTION	DATE
01	ISSUED FOR PERMIT	2025/02/07
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03	ISSUED FOR TENDER	2025/04/04



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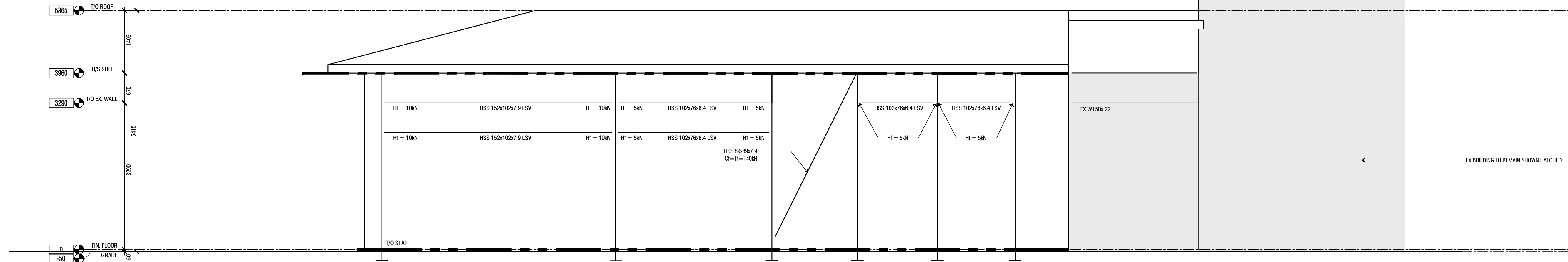


PROJECT INFORMATION KELS0 ARRIVAL CENTRE  
5234 KELS0 ROAD  
MILTON, ON L9E 0C6

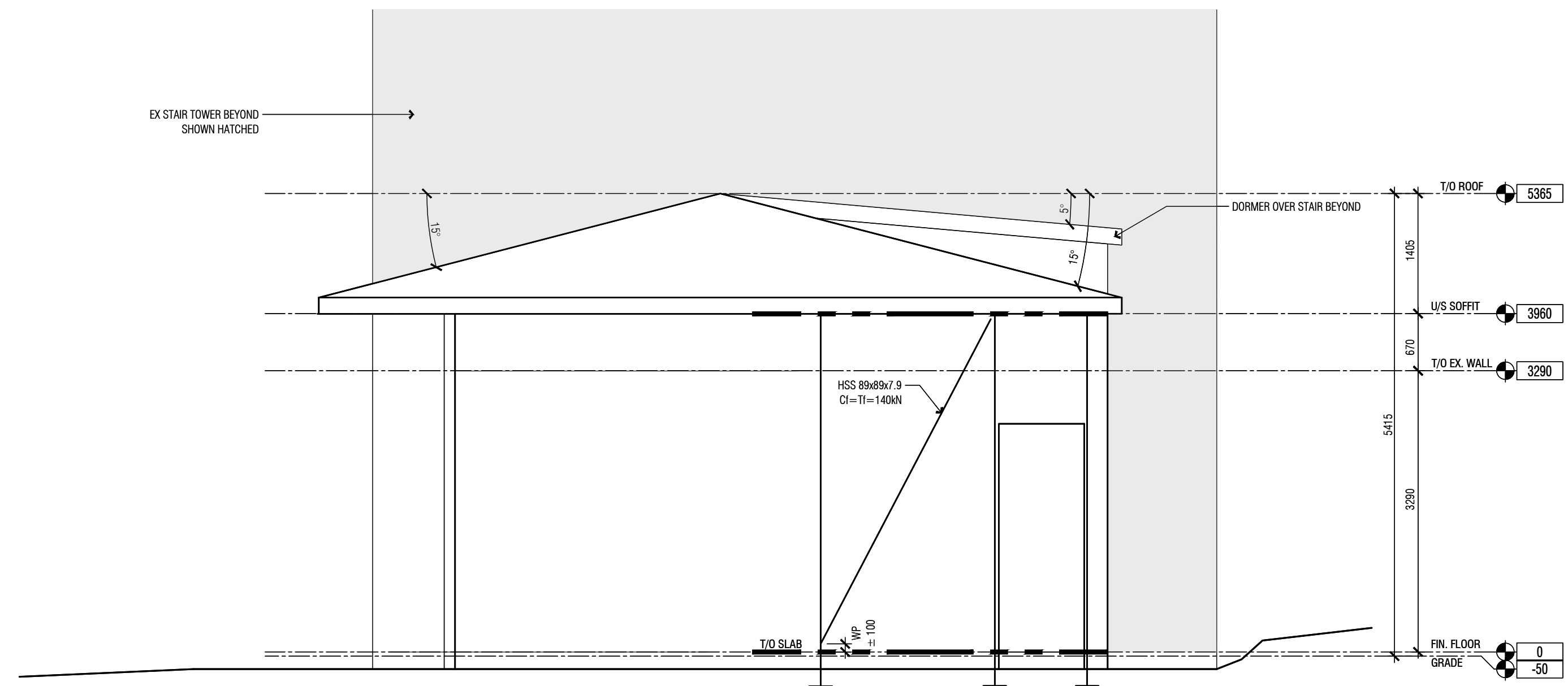
DRAWING TITLE  
STRUCTURAL ELEVATIONS

PROJECT NO.: 24-5162  
DATE: 2024/07/17  
SCALE: 1:50

DRAWN BY: DS  
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1 SOUTH ELEVATION  
S501 1:50



2 WEST ELEVATION  
S501 1:50

## **Section No. 7**

# **VENDOR CODE OF CONDUCT**

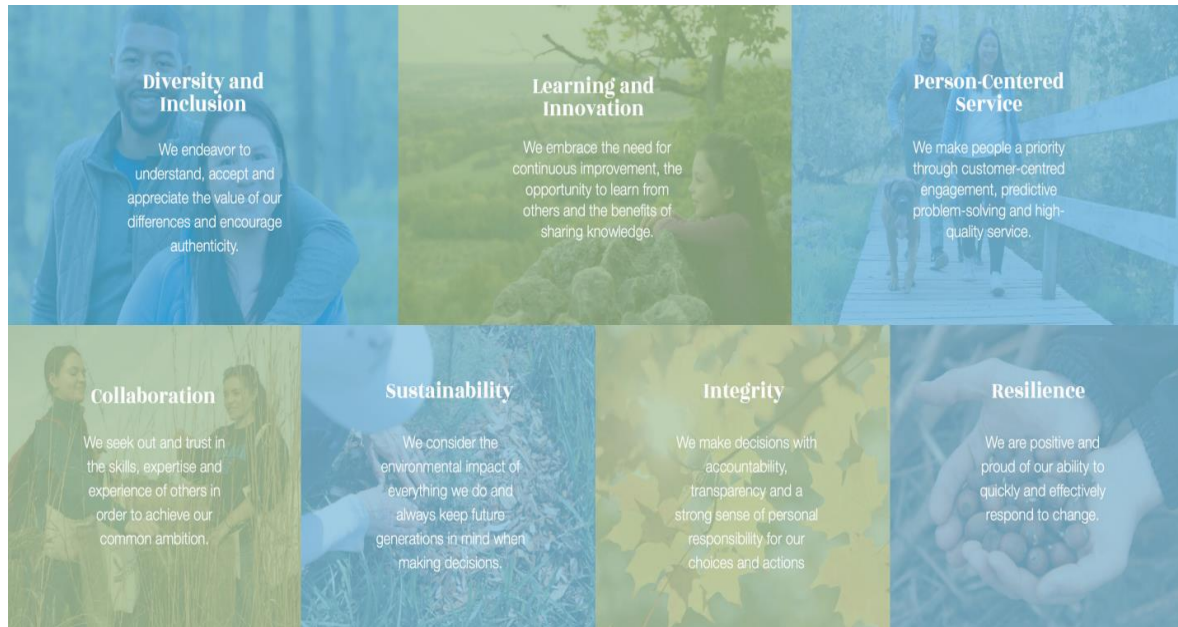


# THE HALTON REGION CONSERVATION AUTHORITY

## Vendor Code of Conduct

**At The Halton Region Conservation Authority (hereinafter “Conservation Halton”), we take a proactive approach to accountability, transparency and professional responsibility. We make difficult decisions about our environment and communities with fairness & integrity in mind. To ensure that we maintain the trust of our stakeholders, it is imperative that our core values (as illustrated below) are evident in everything we do, and that our employees and business partners demonstrate the highest standards of behavior.**

### Conservation Halton Core Values:



### **Intent**

Conservation Halton is committed to conducting every aspect of its business in a lawful, ethical and environmentally conscious manner. Integrity, ethics and environmental sustainability guide every decision made by Conservation Halton. Conservation Halton expects each Vendor to share this perspective and to demonstrate a commitment to these principles in all aspects of its business relations.

Vendors, as well as their employees, agents, suppliers, and subcontractors (hereinafter “Representatives”), must be compliant with the Vendor Code of Conduct while conducting business with, and/or on behalf of, Conservation Halton. The Vendor Code of Conduct sets out minimum requirements that must be met. Vendors are responsible for ensuring that its

Representatives understand and comply with the Conservation Halton Vendor Code of Conduct.

The Vendor Code of Conduct is supplemental to any contractual terms and conditions between Vendors and Conservation Halton, whether or not the Vendor Code of Conduct is enumerated in an agreement between the parties.

## **Application**

### **RESPECT IN THE WORKPLACE**

Conservation Halton expects their vendors to share its commitment to anti-harassment and anti-violence, human rights, equal opportunity and treat everyone with dignity and respect. The vendor's workplace, including on site at Conservation Halton properties, should be free of harassment and discrimination including race, colour, citizenship, national origin, religion, creed, age, disability, gender, marital status, sexual orientation, gender identity, gender expression, family status, or marital status or political affiliation.

Any act of harassment or violence committed by or against any individual at a Conservation Halton workplace or on a Conservation Halton property shall not be tolerated and shall be deemed a material breach of any agreement between Conservation Halton and the Vendor. Should Conservation Halton, at its own and sole discretion, find that a Vendor or its Representative committed an act of harassment or violence, the individual who committed such an act shall be immediately removed from the Conservation Halton workplace or property.

### **HEALTH AND SAFETY**

Vendors shall provide a healthy and safe work environment and be in strict compliance with all applicable health and safety laws, regulations and practices, as well as any Conservation Halton requirements imposed at a Conservation Halton workplace or property. Vendors shall take all necessary steps to identify, assess and control hazards in the working environment in order to protect the health and safety of their employees and Conservation Halton staff.

Vendors shall have a health and safety program that includes up-to-date health and safety policies and procedures and shall appropriately train their Representatives to ensure safety competence and compliance with the Ontario *Occupational Health and Safety Act, R.S.O., 1990, c. O.1* and applicable Regulations. Conservation Halton reserves the right to require proof of training from any Representative and to remove any untrained Representative from the workplace.

## **IMPAIRMENT AT THE WORKPLACE**

All individuals working at Conservation Halton (including volunteers and contractors) are expected to report fit for duty for scheduled work and be able to perform assigned duties safely and acceptably without any limitations due to use or after effects of alcohol, illicit drugs, non-prescription drugs, prescribed medications, or any other substance or issue that may impair judgment or performance. Conservation Halton has taken the position that the presence of illicit drugs, recreational drugs and alcohol on the worksite is not permitted. Any individual failing to adhere to this policy will be subject to discipline up to and including dismissal or contract termination.

## **ETHICAL BUSINESS PRACTICES**

Vendors and their Representatives shall conduct business interactions and activities with integrity, and in accordance with contractual obligations under its agreement with Conservation Halton. Additionally, the Vendor shall, without limitation:

- Honestly and accurately record and report all business information and comply with all applicable laws regarding their completion;
- Create, retain, protect and dispose of business records in full compliance with all applicable legal and regulatory requirements;
- Protect the physical and intellectual assets of Conservation Halton when authorized to use those assets; and
- Only speak to the press about or on behalf of Conservation Halton when expressly authorized to do so in writing by Conservation Halton.

## **CONFLICTS OF INTEREST**

Vendors shall avoid the appearance of, or actual instances of improprieties and/or conflicts of interest. Vendors and their Representatives shall not:

- Deal directly with any Conservation Halton employee whose spouse, domestic partner, relative, or friend holds a management position or ownership interest in the Vendor;
- In the course of negotiating an agreement or performing Vendor's obligations under an agreement, deal directly with a spouse, domestic partner, relative or friend who is employed by Conservation Halton;
- Submit bids/proposals in response to an RFQ, RFT or RFP without acknowledging the Conservation Halton Conflict of Interest clause stated within the bidding documents.

Vendors shall disclose any close relationships (i.e. Friends of family) with Conservation Halton employees in advance of engaging in any negotiation or contract with Conservation Halton.

Vendors shall disclose any information where a relationship does or can be perceived as giving the Vendor an unfair advantage in being awarded a contract or creates a situation where one or both parties could obtain personal gain.

Any actual, perceived, or potential conflicts of interest shall be immediately reported to Conservation Halton's Procurement Manager.

#### **INAPPROPRIATE INFLUENCE / GIFTS & GRATUITIES**

Vendors shall not offer bribes, kickbacks or improper gifts, gratuities or payments of any kind to a Conservation Halton employee, their immediate family or friend. Gifts in cash or kind, and certain entertainment events can be perceived as an attempt to influence the decision of a Conservation Halton employee to the benefit of the giver.

In connection with a Conservation Halton business relationship, agreement or potential agreement, vendors are prohibited from giving any Conservation Halton employee, their immediate family member, or friend:

- Any "tip" or gift of money;
- Any gift other than a token or memento;
- Any offer to make a donation to a charitable cause on their behalf; or
- Any offer to trade goods or services.

#### **CONFIDENTIALITY**

As a condition of providing Conservation Halton with goods or services, Vendors shall comply with all Conservation Halton requirements to keep confidential all passwords, security codes, security and privacy procedures. Vendors shall treat all Conservation Halton information, including, but not limited to, client lists, costs, pricing, employee or agent information, policies, procedures and processes, plans, manuals, designs, drawings, internal programs and engineering, as confidential information, and shall not disclose or reveal this information without Conservation Halton's express written authorization.

#### **LEGAL COMPLIANCE**

Vendors and their Representatives shall conduct their employment practices and business in full compliance with federal, provincial and local laws and regulations. In addition to any specific obligations under an agreement with Conservation Halton, the Vendor shall, without limitation:

- Comply with applicable laws relating to wages and benefits and should pay the higher of the legally prescribed minimum wage or the prevailing industry wage.
- Never use child labour, as defined by local laws and regulations, and under no circumstances shall a worker be younger than the age of 16 or the compulsory age to be in school, whichever is higher. Child labour is strictly prohibited.
- Maintain employee records in accordance with applicable provincial and federal laws and regulations.
- Maintain required and commercially reasonable policies of insurance.
- Ensure it is in good standing with the appropriate regulatory bodies and agencies.
- Comply with all applicable environmental laws and regulations regarding hazardous materials, air emissions, waste and wastewater discharges, as well as the manufacture, transportation, storage, disposal and release into the environment of such materials.
- Comply with antitrust and fair competition laws that govern the jurisdictions where business is conducted.



- Comply with anti-corruption laws of the regions where business is conducted, including anti-bribery
- Comply with laws governing lobbying, gifts and payments to public officials, direct or indirect payments or promises to government officials or Conservation Halton employees for the purpose of obtaining or retaining business on own behalf or on behalf of Conservation Halton.
- Cooperate with investigations by government agencies, officials, and/or Conservation Halton or its agents; be
- Direct and truthful in discussions.

## **ENVIRONMENTAL RESPONSIBILITY**

Conservation Halton strives to manage itself and its operations in a sustainable and environmentally friendly manner. Conservation Halton looks to building relationships with Vendors with a core focus on environmental sustainability and who consistently seek out ways to conserve resources, minimize waste and improve the quality of life of the community. Conservation Halton expects its Vendors to utilize green products whenever possible, recycle waste materials, avoid hazardous materials, whenever possible, and minimize energy usage.

## **COMPLIANCE WITH VENDOR CODE OF CONDUCT**

It is the responsibility of the Vendor to ensure that the Vendor Code of Conduct is communicated to, and adhered to by its directors, officers, executives, managers, and Representatives. Vendors are expected to monitor their own and its Representatives compliance with the Vendor Code of Conduct.

In addition to any other rights Conservation Halton may have under an agreement with the Vendor, Conservation Halton may demand the immediate removal of any Representative whose conduct is unlawful or inconsistent with the Vendor Code of Conduct or any Conservation Halton policy that the Vendor must comply with. Conservation Halton may, at its own and sole discretion, provide the Vendor with an opportunity to bring its own business or conduct, or Representative(s) into compliance with the Vendor Code of Conduct within a reasonable timeframe. Notwithstanding any term or condition in any agreement between the Vendor and Conservation Halton, if the Vendor is non-compliant with the Vendor Code of Conduct, Conservation Halton reserves its right to:

- (i) Provide a verbal or written warning,
- (ii) Terminate the contract/end the business relationship,
- (iii) Disqualify Vendor from future business opportunities with Conservation Halton
- (iv) Report to authorities or take action as appropriate and permitted by law

And the Vendor shall be obligated to indemnify, defend and hold Conservation Halton harmless, for any and all liability, damages and costs arising from its non-compliance and any form of termination of an agreement.

Conservation Halton will not tolerate any retribution or retaliation taken against any individual who has, in good faith, sought out advice or reported questionable behavior and/or a possible violation. Any reported retribution shall be deemed a material breach of any agreement between the Vendor and Conservation Halton, and Conservation Halton may exercise its rights set out

above, and the Vendor shall be immediately disqualified from working with Conservation Halton in the future.

#### **VENDOR ACKNOWLEDGEMENT**

**VENDOR MUST ACCEPT AND ACKNOWLEDGE VENDOR CODE OF CONDUCT BEFORE ANY AGREEMENT IS EXECUTED OR WORK IS COMMENCED.**

Vendor hereby acknowledges to have read and understood and agrees to be bound by all of the terms of the Vendor Code of Conduct.

**Company Name** \_\_\_\_\_

**Print Name** \_\_\_\_\_

**Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

I have authority to bind the Corporation

## **Section No. 8**

# **CONTRACTOR PRE- QUALIFICATION QUESTIONNAIRE**



905.336.1158  
Fax: 905.336.7014  
2596 Britannia Road West  
Burlington, Ontario L7P 0G3  
[conservationhalton.ca](http://conservationhalton.ca)

Protecting the Natural  
Environment from  
Lake to Escarpment

**To:** All Contractors

**Regarding:** Contractor Safety Information Packet

To Whom it May Concern:

Conservation Halton (CH) is pleased that you are interested in becoming pre-approved for current or future work on CH projects. We use safety pre-qualification as a method to develop and maintain a list of preferred Contractors who operate in the safest manner possible. This process is intended to obtain safety related information from Contractors that will help us review and evaluate your overall health and safety program.

CH has a comprehensive Contractor Safety Program. It is our expectation that each Contractor provides for a safe environment for their employees, CH employees, and the public.

We hope that you can appreciate and share our focus on safety, and we ask that you promptly review and complete all requested information in the attached Contractor Safety Information Packet. Contracts will not be awarded until all requested information is received and reviewed by the CH Procurement Manager and/or the appropriate CH Designate (Project Manager). For Contractors engaged on a multi-year basis, the Contractor Safety Qualification Form and Contractor Health and Safety Agreement must be completed and submitted each year by March 31.

The following documents are included with this letter:

- Contractor Health and Safety Information Packet
- Contractor Safety Qualification Form
- Contractor Health and Safety Agreement

These should be submitted in electronic form or in hard copy format to the CH Designate.

Thank you,

NAME:  
POSITION:



## Contractor Pre-qualification Information

Conservation Halton's (CH) Contractor Safety Program is in place to ensure the health and safety of contractors, employees, visitors, as well as protection of facilities and the environment when contract work is performed for the Conservation Halton (CH). As part of this program, CH requires all Contractors to read and comply with this document prior to commencing work, and review and sign the Contractor Safety Acknowledgement Form. Contractors must ensure that their employees and subcontractors are aware of the package contents and agree to follow the requirements.

For Contractors engaged on a multi-year basis, the Contractor Safety Acknowledgement form must be completed and submitted each year by March 31.

Contractors who are often called upon by CH to perform work on an 'as required' basis have the opportunity to be listed on a Vendor of Record (VOR) for health and safety purposes by submitting their Contractor Safety Qualification Form and Contractor Health and Safety Agreement each year by March 31. Once pre-cleared, it will facilitate the engagement of contractors to perform work. The list of pre-cleared contractors is available to all departments within CH.

Signing the Contractor Health and Safety Agreement confirms, among other things, that the Contractor has reviewed CH's Contractor Pre-qualification Packet requirements, understands them, agrees to comply with them and has relayed the contents of the package to their employees and subcontractors.

### QUALIFICATION STEPS

This information packet includes Conservation Halton's minimum expectations regarding the health and safety standards to be followed by contractors, subcontractors and their personnel. This is not intended to be a complete statement of the contractor's legal obligations under applicable laws.

The pre-approval process requires Contractors to:

1. Review the Contractor Pre-qualification Information
2. Complete the Contractor Safety Qualification Form and provide all necessary documentation as stated on the form:
  - a) Liability insurance certificate
  - b) Clearance certificate with local worker's compensation board), if applicable
  - c) Other health and safety related information, if requested
3. Complete and submit the Contractor Safety Qualification Form
4. Review, sign and submit the Contractor Health and Safety Agreement

This information should be submitted in electronic form or in hard copy to the Conservation Halton contact.

## INSURANCE REQUIREMENTS

### **Comprehensive General Liability**

- The Contractor shall supply proof of required comprehensive general liability insurance in an amount of not less than \$5,000,000 and shall maintain such insurance for the duration of the work. CH must also be added as an additional insured and an insurance certificate shall be supplied to the CH.
- Where a contractor or consultant is providing professional services and providing hands on training or working in an active operational area, errors and omissions insurance in an appropriate amount relative to the scope of work.

The requirements for insurance and indemnity as outlined in this document apply unless contradictory terms are contained in the Request for Tenders or Request for Proposal documents issued by the CH.

### **Workplace Safety & Insurance Board (WSIB)**

A current WSIB Clearance Certificate must be provided. The certificate of clearance shall be kept current (expires every 90 days), for the duration of the contract or project.

## COMPLIANCE WITH LEGISLATION AND STANDARDS

### **Occupational Health & Safety Act (OHSA)**

Compliance with all applicable authorities, sections and regulations and standards; in particular, while not limited to the following:

- Ministry of Labour, Immigration, Training and Skills Development (MLITSD)
- Regulation 213/91 (Construction Projects), and in particular the following provisions:
  - Competent Worker (Subsection 1(1))
  - Inspections (for Constructors) (subsection 14(4) and (5))
  - Protective Clothing, Equipment and Devices (Sections 21 to 27)
  - Hygiene (Sections 28 to 30)
  - Scaffolding (Sections 125 to 142)
  - Elevating Work Platforms/Cranes/Hoisting/Rigging (Sections 143 to 158)
  - Electrical Hazards (Section 181 to 195)
  - Operation of Vehicles (Section 96)
- Industrial Establishments, Ontario 851
- Regulation 1101 – First Aid Requirements
- WHMIS Regulation, Ontario 860
- Confined Spaces Regulation, Ontario 632
- Concerning designated substances), Ontario 490 and 278
- Workplace Safety and Insurance Act
- Canadian Standards Association (CSA)

In connection with the obligation of an “employer” under clause 25(2)(j) of the OHSA as to a written occupational health and safety policy and program, Contractors shall provide a copy of their policy and program if requested.

## RESPONSIBILITY FOR EMPLOYEES AND SUB-CONTRACTORS

The Contractor must ensure:

- Compliance with the Occupational Health and Safety Act of Ontario, applicable regulations, and standards.
- Compliance with all applicable environmental legislation.
- They, their subcontractors, and their respective personnel are trained and competent for the work they will be doing during the contract. The training must be completed prior to the commencement of the work.
- Employees of Contractors follow all direction and instruction regarding health and safety standards provided by CH or the Contractor's Supervisor.
- That they supply their own equipment, materials, and other resources, including the provision of personal protective equipment for their employees.

## ADMINISTRATION

1. All Contractors and their employees must report to the facility reception desk and sign in and out before leaving unless alternate arrangements are agreed to.
2. No work is to be performed outside of regular business hours without prior authorization. Regular administration hours are from 8:00am to 5:00pm.
3. The CH Designate shall coordinate any work with the operations groups in the area and inform the Contractor of any potential conflicts or hazards.
4. No alcoholic beverages or illegal substances are permitted at any of the CH work sites, projects or facilities, nor is anyone under the influence of such substances.
5. Parking at the work site shall be designated by CH so as to not interfere with site operations.
6. Contractors shall perform work only in the assigned areas and are not to wander the site or enter any other building or office area without authorization.
7. Keys or gate remotes if assigned shall be signed in and out through the facilities contact and/or as advised by the CH Designate.
8. The Contractor shall cooperate in the completion of all documentation as required by this document or by legislation, prior to receiving authorization to begin work.
9. The Contractor understands that CH reserves the right at any time during the performance of the work/contract by the Contractor, to stop, suspend or terminate such work/contract upon 24 hours written notice to the Contractor if the Contractor has not carried out their obligations of this document.
10. The Contractor shall operate motor vehicles safely throughout the site, obeying all traffic signs and not exceeding the facility posted speed limit.
11. Vehicles shall be secured and not left running while unattended (within line of sight) and care must be taken not to obstruct access points and other vehicle traffic.
12. There is a no smoking by-law in any CH building, including vehicles and enclosed spaces.

## HEALTH AND SAFETY

### **Personal Protective Equipment (PPE)**

Contractors are required to comply with the OSHA and its Regulations and applicable CSA standards regarding PPE including but not limited to: head protection, eye protection, foot protection, skin protection (gloves and protective clothing), hearing protection, respiratory protection and fall arrest protection.

Contractors must provide their employees and other personnel with the necessary PPE to do the work in a health and safe manner and to comply with OSHA and its Regulations. Contractor employees and other personnel assigned to perform work must be trained in the use of PPE. It is the responsibility of the Contractor to see that their employees and other personnel, as applicable, use/wear the PPE.

### **General Disruption**

The Contractor/Constructor shall meet with the CH Designate and other CH staff as deemed appropriate to discuss how work will be planned to minimize disruptions to the operation and to minimize any environmental impacts. The Contractor shall coordinate work and cooperate fully with other contractors and CH staff so as not to disrupt day to day operations or work being performed.

Contractors shall be assigned a work area by the CH Designate and are expected within the boundaries of their assigned work areas.

### **Signs and Barricades**

Barriers and barricades shall be used to warn CH staff, visitors, and other contractors of hazards in your work area. Barriers shall have a tag identifying the reason for the barrier and who is responsible for it, with contact information. Use warning signs, cones, or caution tape to keep others at a safe distance when necessary (e.g., construction activities, hot work, traffic control, falling debris, overhead work, etc.).

### **Use of CH Equipment**

Use of any CH equipment is not permitted without prior authorization and training. Contractors shall supply their own equipment including locks for lockout procedures and fall arrest equipment where required.

### **Contractor Equipment**

Contractors must ensure all equipment is in safe working condition, properly maintained and certified if required by regulations. Only those who have been properly trained and skilled in the operation of this equipment shall operate the equipment on CH work sites or projects. Contractors are expected to follow manufacturer's operating instructions for all the equipment and tools.

### **Hazardous Materials**

Hazardous materials, including designated substances and controlled products, are not to be brought on site unless approved in advance by the CH Designate. Safety data sheets must be submitted and reviewed by CH prior to arrival at site. Arrangements must be made for safe use, storage, and removal from site upon completion of the work.



## **Asbestos**

Only Contractors certified in asbestos work are allowed to work in areas at CH where asbestos is located. A Contractor hired to perform a Type 3 asbestos removal will notify the Ministry of Labour, Training and Development orally and in writing before beginning work.

## **Designated Substances**

CH will provide the Contractor with a list of designated substances present at the project site prior to the contract being signed. The Contractor must provide each prospective subcontractor for the project with this list prior to the Contractor or subcontractor entering into a contract.

## **Mould (Ontario Environmental Guidelines)**

If mould or suspicion of mould is discovered during any contract work at CH, it must be reported immediately to the CH Designate. Mould removal can only be performed by Contractors trained in proper mould abatement procedures, using Ontario guidelines and other applicable legislation.

## **Housekeeping**

The Contractor is responsible for maintaining their work area in accordance with industry safe work practices, including housekeeping. The work area shall be left clean and free of refuse and debris at the end of each day.

## **Electrical and Hazardous Energy Sources**

Only Contractors who are certified electricians have the right to work on electrical equipment at CH. Contractors working with electrical equipment or devices must follow the requirements of the Electrical Safety Code and the OHSA and its Regulations. All electrical projects must be completed with an Electrical Safety Authority Inspection and Certificate. Contractors must ensure their employees use the required personal protective equipment required when working with electrical equipment.

Extension cords shall not be overloaded and shall only be used for the purpose of providing temporary power to portable electric tools and lights. Ground fault circuit interrupters shall be used when using any electrical equipment outdoors or in wet environments.

## **Lockout/Tag Out**

Hazardous sources of energy must be isolated to ensure the safety of the worker. Contractors are expected to follow lockout/tag out protocols that meet or exceed those of the CH.

## **Confined Space Entry**

Contractors are not permitted to enter any confined space without authorization from the CH Designate. Confined Spaces shall be entered only after all CH confined space entry protocols and legislative requirements are met. A confined space assessment, entry plan, entry permit and rescue plan are required for contractors performing work in confined spaces. Contractors shall ensure employees who are authorized to enter confined spaces are properly trained and competent to do so, following all legislated requirements. Training records shall be provided by the contractor for the individuals they authorize to enter confined spaces. If more than one contractor is engaged in work in or about the same confined space, a coordination document shall be completed by the Contractor.

## **Hot Work**

The CH Designate must be notified if the contractor is required to perform hot work activities. The Contractor shall ensure that measures are in place to prevent fire or injury to workers in and around the work area, and a hot work permit must be completed prior to the start of work.

## **Working at Heights and Fall Protection**

Ladders: Contractors must ensure that ladders are in safe condition, and they are used appropriately, in a safe manner according to industry standards and regulations. Metal ladders shall not be used in connection with electrical work or near energized electrical conductors or installations.

Scaffolding: All scaffolding shall be erected and dismantled by competent workers, under the supervision of knowledgeable and experienced workers. It shall be securely fastened with all braces, pins, screw jacks, base plates and other fittings installed as required by the manufacturer. Scaffolds over 15 meters in height must be designed and approved by a professional engineer and constructed in accordance with the design.

Guardrails: Guardrails shall consist of a top rail, mid-rail, and a toe board. Guardrails must be provided around work platforms on scaffolds, floor openings, ramps, and open areas where a worker can fall from one level to another. When guardrails or opening covers are temporarily removed, workers in the area must be protected by a full body harness connected to a fall-arrest system, with the belt and lanyard tied off to a secure anchor. Barricades, guardrails, and floor opening covers must be replaced in a proper manner, immediately after the work is completed.

Roof Tops and Heights 3 Meters or Higher: Work on roof tops and other heights must be performed in a manner that ensures the worker is not exposed to a fall. Appropriate travel restraint, guardrails or other acceptable fall protection measures shall be employed. NO work shall be carried out within 3 meters of a roof edge unless a fall protection system is in place.

## **Excavation, Trenching and Shoring**

Excavation work that requires a worker to enter a trench, pit or other sub-grade area where there is a potential for collapse, the work area shall be sloped, stepped, shored or secured with a trench box to protect the safety of the worker.

## **Lifting Devices (Cranes, Hoists, Rigging, Mobile Lift Equipment)**

Lifting devices shall only be operated by competent workers (training records must be provided) and must be done in accordance with applicable regulations and standards. Warning barriers and spotters shall be used to protect the safety of workers and other persons who may enter in or around the work area. All lifting devices and related equipment brought on site shall be in safe working order, including all required inspections, certifications, and maintenance.

## **Additional Safety Items**

- Birds, rodents, and insects pose a nuisance and possible health and safety hazard due to their presence at the work site. Wildlife is to be respected and undisturbed during your time on site. Report any hazards associated with wildlife you may encounter to the Ch Designate.
- Contractors are required to provide required first aid supplies and qualified first aid providers unless an agreement is made with the CH for those services.

- In the event of a fire, the Contractor shall leave the building or work area by the closest available exit and report to the muster location and check in with their on-site contact. If the fire started in the area of their work, the Contractor shall notify CH staff of the problem immediately.
- The Contractor is responsible for the protection of persons and property during the performance of the work. All precautions shall be taken to prevent persons from entering unguarded or dangerous areas. Adequate signage, barriers, fences, etc., shall be erected depending on the nature of the work and related hazards. Signage shall include the name and contact information of the responsible person.

### **Construction Projects**

If the scope of work meets the criteria to be classified as a construction project (OHS Act Section 6), CH and the Contractor must determine who will have charge over the construction project. This relationship must be established prior to job start-up. All provisions of the Occupational Health & Safety Act concerning construction projects and the duties of the constructor or owner must be met. In the case of construction projects, additional information and forms will be discussed at pre-start up meetings by the CH Designate or other CH Management Representative.

### **Pre-project Safety Review**

On request by CH, the Contractor must attend a pre-project safety review with the CH Designate. The purpose of the review is to organize the work and discuss the safety aspects of the project. Exception: Contractors retained for routine maintenance that includes several projects over a long-term period are only required to attend one pre-project safety review annually.

A pre-project safety review is required for all projects such as, but not limited to:

- Utility modifications
- Electrical & plumbing work
- Working with ladders greater than 3 metres, scaffolds, work platforms, suspended platforms and scaffolds and elevating work platforms
- Confined space entry
- Use of chemicals
- Remediation of mould or asbestos removal, or work in proximity to asbestos
- Work with any designated substance or in any area where there is a designated substance; and
- Hot work or welding.

The purpose of the meeting will be to identify potential health and safety concerns. Those present at the safety review meeting include the CH Designate and the site supervisor for the Contractor. All safety concerns must be discussed and resolved prior to the work beginning.

Where applicable, the Contractor will submit a Notice of Project to the Ministry of Labour, Training and Development (Regulation 213/91 Construction Projects) when:

- The project has a total cost of labour and materials expected to exceed \$50,000 or \$250,000 if the project is confined to a factory that manufactures or assembles automobiles
- The work is the erection or structural alteration of a building more than two stories or more than 7.5 metres high,
- The work is the demolition of a building at least 4 metres high with a floor area of at least 30 square meters,

- The work is the erection, structural alteration or structural repair of a bridge, an earth-retaining structure or a water-retaining structure more than 3 metres high or of a silo, chimney or a similar structure more than 7.5 metres high
- Work in compressed air is to be done at the project
- A tunnel, caisson, cofferdam or well into which a person may enter is to be constructed at the project
- A trench into which a person may enter is to be excavated at the project and the trench is more than 300 metres long or more than 1.2 metres deep and over 30 metres long
- The work is the construction, over frozen water, slush, or wetlands, of an ice road for vehicles, machinery, or equipment; or
- A part of the permanent or temporary work is required by this Regulation to be designed by a professional engineer.

### **Violence and Harassment**

Conservation Halton is committed to providing a work environment which values and promotes diversity, inclusion, and respectful and equitable treatment of all persons. Any acts of violence, threats, discrimination, bullying, or harassment in the workplace are unacceptable and will not be tolerated. This policy applies to all employees, volunteers, students, vendors, contractors, members of the public or Board of Directors, and domestic partners.

## **INCIDENT REPORTING**

In the event a contractor's employee sustains any injury, the injury shall be reported as per relevant legislation.

In the event of a critical injury, as defined by the Occupational Health and Safety Act, the Contractor shall follow all procedures in accordance with OSHA. It is the expectation that all critical injuries are investigated by the Contractor and the investigation report is supplied to CH within 48 hours of the incident. In addition, CH Security and/ or Health and Safety will investigate:

- all injuries involving a CH employee or injuries where a CH employee was affected,
- all incidents involving property damage.

Under no circumstances shall the scene of a critical injury be altered, except to:

- save life or relieve human suffering,
- maintain an essential public utility service,
- prevent unnecessary damage to equipment or other property.



# Contractor Safety Qualification Form

Please complete required sections and return form to the Conservation Halton sender

SECTION 1 – GENERAL INFORMATION		
Company Name:		Phone:
Street Address:		City:
Province:		Postal Code:
Form Completed By:		Date:
Title:	Phone No.:	Email:
Describe the nature of your business including all services performed		
Does your company use sub-contractors? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, please provide names of all your subs that will be used on Conservation Halton projects:		

SECTION 2 – HEALTH & SAFETY CONTACT		
Who is the point person for health and safety within your organization?		
Name/Title:	Telephone No.:	Email:
If you do not have a dedicated health and safety professional, who is responsible for health and safety within your organization?		

No. of Employees: ☐ 0 ☐ 1-5 ☐ 6-19 ☐ 20-50 ☐ 50+

SECTION 3 – HEALTH & SAFETY PROGRAM AND PROCEDURES	
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Does your company have a Health and Safety Policy showing management's commitment to comply with applicable legislation and to prevent injuries / illnesses?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Does your company have a Health and Safety Manual containing health and safety programs and procedures to control health and safety hazards?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Does your company ensure supervisors are "competent persons" as defined by the Occupational Health and Safety Act? "Competent person" means a person who a) is qualified because of knowledge, training and experience to organize the work and its performance, b) is familiar with this Act and the regulations that apply to the work, and c) has knowledge of any potential or actual danger to health or safety in the workplace.
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Does your company perform health and safety site inspections appropriate for the duration of the work? (e.g. pre-job, periodic, post-job, etc.)
<input type="checkbox"/> Yes <input type="checkbox"/> No	Does your company have a personal protective equipment program in place to ensure provision of appropriate PPE, proper maintenance, and enforcement of PPE usage?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Does your company have training programs to ensure all employees are trained to understand relevant legislation and to be able to perform their jobs safely?
<input type="checkbox"/> Yes <input type="checkbox"/> No	Does your company have a no tolerance workplace violence and harassment policy?

<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Does your company ensure proper trades qualification (i.e., licenses and certification)?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Does your company have Safety Data Sheets (SDS) of all agents used onsite, so that the Conservation Halton can have access to them?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Does your company conduct and document pre-start inspections of vehicles, heavy equipment and other dangerous equipment? Is regular maintenance conducted on all equipment?
<input type="checkbox"/> Yes <input type="checkbox"/> No	Does your company have emergency response plan and site-specific health and safety plan for each of your projects?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Does your company report accidents to the appropriate authorities (e.g., MOL, WSIB, etc.) within the timeline given by the authorities?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	If your company hire subcontractors? Does your company have a contractor safety program that would fulfill all Conservation Halton and contractual requirements (e.g., valid WSIB coverage, adequate liability insurance coverage and trained and qualified employees)?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Does your company have a hazardous waste disposal and environmental protection program in accordance with all applicable environmental legislation?
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A WSIB/WCB Account No.:	Is your company in a rebate / neutral position according to the local worker compensation authority (latest 3 years)? If not, please explain why and what has been done to improve statistics:
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Is your company free of any health and safety charges or convictions within the past 36 months? If no, please explain:

By signing this document, I confirm that I have full authority to represent the company on all matters relating to this Contractor Safety Qualification and I verify the accuracy of the responses, statements and any additional information submitted to process this application.

Signature: \_\_\_\_\_

### To be Completed by Conservation Halton

SAFETY QUALIFICATIONS	
<input type="checkbox"/>	APPROVED – Met minimum standards Reviewer: _____ Signature: _____ Date: _____
<input type="checkbox"/>	APPROVAL PENDING – Add'l information requested: _____ APPROVED – Requested info received on: _____ Reviewer: _____ Signature: _____
<input type="checkbox"/>	NOT APPROVED – Did not meet minimum safety standards (describe): _____ Reviewer: _____ Signature: _____ Date: _____
DOCUMENTATION	
<input type="checkbox"/> Received	Liability insurance certificate (most recent) with CH added as an additional insured* *For RFT or RFP's, Procurement Manager will verify insurance requirements
<input type="checkbox"/> Received <input type="checkbox"/> N/A	Proof of good standing with local worker compensation authority (most recent – if using the WSIB eClearance to create Clearance Certificate, please select "Halton Region Conservation Authority / Conservation Halton")
<input type="checkbox"/> Received	Signed Contractor Safety Agreement
Verified by (print): _____	Signature: _____ Date: _____



905.336.1158  
Fax: 905.336.7014  
2596 Britannia Road West  
Burlington, Ontario L7P 0G3  
conservationhalton.ca

Protecting the Natural  
Environment from  
Lake to Escarpment

## Contractor Health and Safety Agreement

Dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

**BETWEEN** Conservation Halton ("CH")

**AND** \_\_\_\_\_ ("Contractor")

Signing this acknowledgement indicates that the Contractor has read Conservation Halton's Contractor's Health and Safety Packet and agrees to comply with the requirements within. It is the responsibility of the Contractor to ensure that all subcontractors and all personnel assigned to perform work on CH property or in CH buildings are aware of and comply with these requirements.

Contractor acknowledges and understands that CH is relying on the statements, commitments and representations made in this Contractor Health and Safety Agreement to enter into a contract and to continue doing business with the Contractor under an existing contract. All commitments in the Contractor Health and Safety Agreement are deemed incorporated into, and to form part of, the contract with CH without the requirement of a formal contract amendment or additional consideration.

The Contractor shall submit the required forms as required or when requested. CH may request proof of other qualifications, safe procedures and /or certifications at any time.

Should the Contractor fail to submit the forms or other information when requested, CH has the right to terminate or suspend work without any liability to the Contractor in connection with such termination or suspension.

### AGREED TO BY THE FOLLOWING DULY AUTHORIZED REPRESENTATIVE:

Print Name: \_\_\_\_\_

Print Title: \_\_\_\_\_

Signature: \_\_\_\_\_

# 250424 - Kelso Arrival Centre Reno - CH

Opening Date: April 24, 2025 12:00 PM

Closing Date: May 22, 2025 2:00 PM

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Schedule of Prices

The Bidder hereby Bids and offers to enter into the Contract referred to and to supply and do all or any part of the Work which is set out or called for in this Bid, at the unit prices, and/or lump sums, hereinafter stated. HST is additional.

\* Denotes a "MANDATORY" field

Do not enter \$0.00 dollars unless you are providing the line item at zero dollars to the Owner.

If the line item and/or table is "NON-MANDATORY" and you are not bidding on it, leave the table and/or line item blank.Do not enter a \$0.00 dollar value.

Schedule of Prices

All pricing submitted shall include all costs necessary to perform the work. No additional payments will be made to the Vendor for any unforeseen or additional work without prior written consent of the Owner's Project Manager. It is the responsibility of the successful Vendor to know the extent of the work required to successfully carry out the work. Unit Prices shall be exclusive of HST.

Line Item	Item No.	Description	Quantity	Unit	Unit Price *	Total	
1	1.01	Labour	1	LS			
2	1.02	Materials	1	LS			*
3	1.09	Total Bonding costs.	1	LS			
Subtotal:							

Summary Table

Bid Form	Amount
Schedule of Prices	
HST (13%)	\$ 0.00
Total Contract Amount:	

Specifications

Ability to Meet the Project Schedule

Line Item	Substantial Date of November 1, 2025	Ability to Meet the Schedule *	
1		<input type="radio"/> Yes <input type="radio"/> No	*

All references stated shall be for the same or similar scope as the one described in this Bid.

For newly formed business entity including, corporations, partnerships and sole proprietors or a Contractor teaming arrangement you shall state below in the Client Column that you were not the "Contractor" for the named project and should state whose past experience on the named project is relevant to that reference.

### List of References - Applicable Past Projects of Similar Nature

Line Item	Client References *	Contact Name *	Contact Phone and Email *	Contract Term (years) *	Contract Value *
1					
2					
3					
4					
5					

### Sub-Contractors

The Bidder shall state all Subcontractor(s) and type of Work proposed to be used for this project. Bidders shall not indicate "TBD" (To Be Determined) or "TBA" (To Be Announced) or similar wording and shall not indicate multiple choices of Subcontractor names for any Subcontractor category in their list of Subcontractors.

The Bidder shall state only one (1) subcontractor for each type of work

Bidder(s) shall upon request by the Owner produce a list of references for all or any proposed Subcontractors within three (3) business days.

### Subcontractors List

Name of Subcontractor *	Type of Work to be Performed by Sub-contract *	Estimate Value *	Contact Name *	Telephone No. *	
					*
					*
					*
					*
					*

### Documents

It is your responsibility to make sure the uploaded file(s) is/are not defective or corrupted and are able to be opened and viewed by the Owner. If the attached file(s) cannot be opened or viewed, your Bid Call Document may be rejected.

- Proof of Insurance - Per the RFT \* (mandatory)
- WSIB Certificate \* (mandatory)
- Contractor Healthy & Safety / Questionnaire \* (mandatory)
- Vendor Code of Conduct - CH \* (mandatory)
- Project Gantt Chart \* (mandatory)
- Agreement to Bond -(Labour / Material). \* All Bond costs are to be captured in Pricing table 1. \* (mandatory)

- Bid Bond 10% \* (mandatory)
- Performance (Labour & Material) (optional)

Addenda, Terms and Conditions

☐ The Bidder confirms and declares that they are authorized representatives of the company submitting the bid for this work and that the company they are submitting on behalf of is fully aware of the requirements of this contract. The bidder shall declare any potential conflict of interest that could arise from bidding on this bid. Do you have a potential conflict of interest? ☒ **Yes** ☐ **No**

The Bidder acknowledges and agrees that the addendum/addenda below form part of the Bid Document

Please check the box in the column "**I have reviewed this addendum**" below to acknowledge each of the addenda.

File Name	I have reviewed the below addendum and attachments (if applicable)	Pages
There have not been any addenda issued for this bid.		