

Solicitation Cover Page

RETURN BIDS TO:

Agriculture and Agri-Food Canada

Address: Eastern Service Centre

Attention: Claudia Lauzier

Email: aaafc.escprocurement-cseapprovisionnement.aac@agr.gc.ca

INVITATION TO TENDER

Proposal To: Agriculture and Agri-Food Canada

We hereby offer to sell to His Majesty the King in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods and service, and construction as listed herein and on any attached sheets at the price(s) set out therefore.

Comments:

Vendor/Firm Name and Address:

Issuing Office

Agriculture and Agri-Food Canada
Eastern Service Centre

Title: Roof Replacement - Building 74 - Central Experimental Farm Ottawa	
Solicitation Number 01B46-23-207	Date of solicitation: 2023-12-19
Solicitation Closes: At: 2:00pm On: 2024-01-12	Time Zone: EST
Address Enquiries to: Name: Claudia Lauzier, Contract Specialist Email: claudia.lauzier@agr.gc.ca	
Telephone Number: 438-455-2392	FAX Number:
Destination of Goods, Services and Construction: Central Experimental Farm Ottawa 960 Carling Avenue Ottawa, ON K1A 0C6	
Instructions: Municipal taxes are not applicable. Unless otherwise specified herein all prices quoted must include all applicable Canadian customs duties, GST/HST, excise taxes and are to be delivered Delivery Duty Paid including all delivery charges to destination(s) as indicated. The amount of the Goods and Services Tax/Harmonized Sales Tax is to be shown as a separate item.	
Delivery required:	Delivery offered:
Vendor/Firm Name and Address:	
Name and title of person authorized to sign on behalf of vendor/firm (type or print)	
Signature	
Date	

INVITATION TO TENDER

Roof Replacement - Building 74
Central Experimental Farm Ottawa
960 Carling Avenue
Ottawa, ON K1A 0C6

IMPORTANT NOTICE TO BIDDERS

Note to Bidders, there will no Public Opening for the purposes of this solicitation. See SI07 for further Instructions.

LISTING OF SUBCONTRACTORS AND SUPPLIERS

Take note that R2710T, GI07 "Listing of Subcontractors and Suppliers" has been amended. See SI11 of the Special Instructions. **Failure to do so will result in the disqualification of its bid.**

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SPECIAL INSTRUCTIONS TO BIDDERS (SI)

SI01 BID DOCUMENTS

1. The following are the Bid Documents:
 - a. Invitation to Tender - Page 1;
 - b. Special Instructions to Bidders;
 - c. General Instructions - Construction Services - Bid Security Requirements R2710T (2021-04-01)
Delete: Subsection G116 Performance Evaluation: in its entirety
Insert: G116 intentionally left blank
Delete: point 3 in its entirety
 - d. Clauses & Conditions identified in "Contract Documents";
 - e. Specifications & Drawing;
 - f. Bid and Acceptance Form and related Appendix(s); and
 - g. Any amendment issued prior to solicitation closing.

Submission of a bid constitutes acknowledgement that the Bidder has read and agrees to be bound by these documents.

2. General Instructions - Construction Services - Bid Security Requirements R2710T is incorporated by reference and is set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is available on the PWGSC Web site: <https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R>

SI02 ENQUIRIES DURING THE SOLICITATION PERIOD

1. Enquiries regarding this bid must be submitted in writing to the Contracting Authority named on the Invitation to Tender - Page 1 at e-mail address claudia.lauzier@agr.gc.ca Except for the approval of alternative materials as described in G115 of R2710T, enquiries should be received no later than 5 business days prior to the date set for solicitation closing to allow sufficient time to provide a response. Enquiries received after that time may result in an answer NOT being provided.
2. To ensure consistency and quality of the information provided to Bidders, PWGSC will examine the content of the enquiry and will decide whether to issue an amendment.
3. All enquiries and other communications related to this bid sent throughout the solicitation period must be directed ONLY to the Contracting Authority named in paragraph 1 above. Failure to comply with this requirement may result in the bid being declared non-compliant.

SI03 REVISION OF BID

Bids may be revised using the email address indicated on page 1 (cover page) of this invitation to tender (ITT) or using Canada Post Corporation (CPC) Connect service.

Section G110 of R2710T is replaced by the following;

1. A bid submitted in accordance with these instructions may be revised, provided the revision is received through Canada Post Corporation's (CPC) Connect service, on or before the date and time set for the closing of the solicitation. The revision shall be on the Bidder's letterhead or bear a signature that identifies the Bidder.
 - a. The only acceptable email address to use with CPC Connect is: aafc.procbidreceiving-receptiondesoumissionaprov.aac@agr.gc.ca
2. A revision to a bid that includes unit prices must clearly identify the change(s) in the unit price(s) and the specific item(s) to which each change applies.
3. Multiple revisions to a bid must clearly identify the sequence of the revisions (i.e. Bid revision #1; Bid revision #2, etc.).
4. Failure to comply with any of the above provisions may result in the rejection of the non-compliant revision(s) only. The bid shall be evaluated based on the original bid submitted and all other compliant revision(s).

5. For revised bids transmitted by CPC Connect service, Canada will not be responsible for any failure attributable to the transmission or receipt of the bid including, but not limited to, the following:
 - i. receipt of a garbled, corrupted or incomplete bid;
 - ii. availability or condition of the CPC Connect service;
 - iii. incompatibility between the sending and receiving equipment;
 - iv. delay in transmission or receipt of the bid;
 - v. failure of the Bidder to properly identify the bid;
 - vi. illegibility of the bid;
 - vii. security of bid data; or,
 - viii. inability to create an electronic conversation through the CPC Connect service.

SI04 BID SECURITY REQUIREMENTS

R2710T - General Instructions - Construction Services - Bid Security Requirements is modified as follow:

Delete GI08.2 and replace with the following:

2. A bid bond (form PWGSC-TPSGC 504) shall be in an approved form, properly completed, with valid and enforceable signatures and sealed by the approved bonding company whose bonds are acceptable to Canada either at the time of solicitation closing or as identified in Treasury Board Appendix L, Acceptable Bonding Companies.
- 2.1 A bid bond may be submitted in an electronic format (Electronic Bonding (E-Bond)) if it meets the following criteria:
 - a. The version submitted by the Bidder must be an electronic encrypted file with embedded digital certificate verifiable by Canada with respect to the totality and wholeness of the bond form, including: the content; all digital signatures; all digital seals; with the Surety Company, or an approved verification service provider of the Surety Company.
 - b. The version submitted must be viewable, printable and storable in standard electronic file formats compatible with Canada, and in a single file, allowable format pdf.
 - c. The verification may be conducted by Canada immediately or at any time during the life of the Bond and at the discretion of Canada.
 - d. The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding Item 2.1.a.
 - e. Submitting copies (**non-original, non-verifiable or scanned copy**) of signed and sealed bid bond are not acceptable. Failure to submit an original or verifiable bond will render the bid non-compliant. Non-compliant bids will be given no further consideration. A scanned copy of a bond does not constitute a digital bond.
- 2.2 Bonds failing the verification process will NOT be considered valid.
- 2.3 Bonds passing the verification process will be treated as original and authentic.

SI05 SUBMISSION OF BID

Bids can be submitted using the email address indicated on page 1 (cover page) of this invitation to tender (ITT) or using Canada Post Corporation (CPC) Connect service.

Section GI09 of R2710T is modified by the following:

Insert the following text under subparagraph 4.

5. Electronic Bid Submission by Canada Post Corporation (CPC) Connect service
 - a. Unless specified otherwise in the bid solicitation, bids may be submitted by using the Connect service provided by Canada Post Corporation.

The only acceptable email address to use with CPC Connect for responses to bid solicitations issued by Agriculture and Agri-Food Canada is: aafc.procbidreceiving-receptiondesoumissionaprov.aac@agr.gc.ca

Note: Bids will not be accepted if emailed directly to this email address. This email address is to be used to open a CPC Connect conversation, as detailed in "c." below of this solicitation, or to send bids through a CPC Connect message if the bidder is using its own licensing agreement for CPC Connect service.

- b. To submit a bid using CPC Connect service, the Bidder must either:
 - i. send directly its bid only to the specified AAFC Bid Receiving Unit, using its own licensing agreement for CPC Connect provided by Canada Post Corporation; or
 - ii. send as early as possible, and in any case, at least six business days prior to the solicitation closing date and time, (in order to ensure a response), an email that includes the bid solicitation number to the specified AAFC Bid Receiving Unit requesting to open a CPC Connect conversation. Requests to open a CPC Connect conversation received after that time may not be answered.
- c. If the Bidder sends an email requesting CPC Connect service to the specified AAFC Bid Receiving Unit in the bid solicitation, an officer of the AAFC Bid Receiving Unit will then initiate a CPC Connect conversation. The CPC Connect conversation will create an email notification from Canada Post Corporation prompting the Bidder to access and action the message within the conversation. The Bidder will then be able to transmit its bid afterward at any time prior to the solicitation closing date and time.
- d. If the Bidder is using its own licensing agreement to send its bid, the Bidder must keep the CPC Connect conversation open until at least 30 business days after the solicitation closing date and time.
- e. The bid solicitation number should be identified in the CPC Connect message field of all electronic transfers.
- f. It should be noted that the use of CPC Connect service requires a Canadian mailing address. Should a bidder not have a Canadian mailing address, they may use the AAFC Bid Receiving Unit address specified in the solicitation in order to register for the CPC Connect service.
- g. For bids transmitted by CPC Connect service, Canada will not be responsible for any failure attributable to the transmission or receipt of the bid including, but not limited to, the following:
 - i. receipt of a garbled, corrupted or incomplete bid;
 - ii. availability or condition of the CPC Connect service;
 - iii. incompatibility between the sending and receiving equipment;
 - iv. delay in transmission or receipt of the bid;
 - v. failure of the Bidder to properly identify the bid;
 - vi. illegibility of the bid;
 - vii. security of bid data; or,
 - viii. inability to create an electronic conversation through the CPC Connect service.
- h. AAFC Bid Receiving Unit will send an acknowledgement of the receipt of bid document(s) via the CPC Connect conversation, regardless of whether the conversation was initiated by the supplier using its own license or AAFC Bid Receiving Unit. This acknowledgement will confirm only the receipt of bid document(s) and will not confirm if the attachments may be opened nor if the content is readable.
- i. Bidders must ensure that they are using the correct email address for the AAFC Bid Receiving Unit when initiating a conversation in CPC Connect or communicating with the AAFC Bid Receiving Unit and should not rely on the accuracy of copying and pasting the email address into the CPC Connect system.
- j. A bid transmitted by CPC Connect service constitutes the formal bid of the Bidder.
- k. Alternate arrangements of bid receipt can be made by contacting the Contracting Authority identified on page 1 of the solicitation package no later than one (1) business day prior to bid closing.

SI06 BID RESULTS

1. There will be no Public Opening for the purposes of this solicitation.
2. The responsive bid carrying the lowest price will be recommended for contract award.
3. Following solicitation closing, bid results may be obtained by e-mail a request to claudia.lauzier@agr.gc.ca.

SI07 INSUFFICIENT FUNDING

In the event that the lowest compliant bid exceeds the amount of funding allocated for the Work, Canada in its sole discretion may

- a. cancel the solicitation; or
- b. obtain additional funding and award the Contract to the Bidder submitting the lowest compliant bid.

SI08 BID VALIDITY PERIOD

1. Canada reserves the right to seek an extension to the bid validity period prescribed in BA04 of the Bid and Acceptance Form. Upon notification in writing from Canada, Bidders will have the option to either accept or reject the proposed extension.
2. If the extension referred to in paragraph 1. above is accepted, in writing, by all those who submitted bids, then Canada will continue immediately with the evaluation of the bids and its approvals processes.
3. If the extension referred to in paragraph 1. above is not accepted in writing by all those who submitted bids then Canada will, at its sole discretion, either
 - a. continue to evaluate the bids of those who have accepted the proposed extension and seek the necessary approvals; or
 - b. cancel the invitation to tender.
4. The provisions expressed herein do not in any manner limit Canada's rights in law or under GI11 of R2710T.

SI09 RIGHTS OF CANADA

1. Canada reserves the right to:
 - a. Reject any or all bids received in response to the bid solicitation;
 - b. Enter into negotiations with bidders on any or all aspects of their bids;
 - c. Accept any bid in whole or in part without negotiations;
 - d. Cancel the bid solicitation at any time;
 - e. Reissue the bid solicitation;
 - f. If no compliant bids are received and the requirement is not substantially modified, reissue the bid solicitation by inviting only the bidders who bid to resubmit bids within a period designated by Canada; and
 - g. Negotiate with the sole compliant Bidder to ensure best value to Canada.

SI10 SECURITY CLEARANCE REQUIREMENTS

There is no security requirement associated with the work.

SI11 LISTING OF SUBCONTRACTORS AND SUPPLIERS

R2710T, GI07 has been amended to the following.

GI07 (2015-02-25) Listing of Subcontractors and Suppliers

The Bidder must submit the names of Subcontractors and Suppliers for the part or parts of the Work listed. See APPENDIX 2. **Failure to do so will result in the disqualification of its bid.**

SI12 BID CHALLENGE AND RECOURSE MECHANISMS

- (a) Several mechanisms are available to potential suppliers to challenge aspects of the procurement process up to and including contract award.

(b) Canada encourages suppliers to first bring their concerns to the attention of the Contracting Authority. Canada's [Buy and Sell](#) website, under the heading "[Bid Challenge and Recourse Mechanisms](#)" contains information on potential complaint bodies such as:

- Office of the Procurement Ombudsman (OPO)
- Canadian International Trade Tribunal (CITT)

(c) Suppliers should note that there are **strict deadlines** for filing complaints, and the time periods vary depending on the complaint body in question. Suppliers should therefore act quickly when they want to challenge any aspect of the procurement process.

S113 CONSTRUCTION DOCUMENTS

The successful Contractor will be provided (**with 1 electronic or paper copy**) of the sealed and signed drawings, the specifications and the amendments upon acceptance of the offer. Additional copies, up to a maximum (0), will be provided free of charge upon request by the Contractor. Obtaining more copies will be the responsibility of the Contractor including costs.

S114 WEB SITES

The connection to some of the Web sites in the solicitation documents is established by the use of hyperlinks. The following is a list of the addresses of the Web sites:

Treasury Board Appendix L, Acceptable Bonding Companies
<http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494§ion=text#appl>

Buy and Sell
<https://www.achatsetventes-buyandsell.gc.ca>

Canadian economic sanctions
<http://www.international.gc.ca/sanctions/index.aspx?lang=eng>

Bid Bond (form PWGSC-TPSGC 504)
<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/504.pdf>

Performance Bond (form PWGSC-TPSGC 505)
http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/505_eng.pdf

Labour and Material Payment Bond (form PWGWSC-TPSGC 506)
<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/506.pdf>

Standard Acquisition Clauses and Conditions (SACC) Manual
<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R>

Declaration Form
<http://www.tpsgc-pwgsc.gc.ca/ci-if/formulaire-form-eng.html>

Trade agreements
<https://buyandsell.gc.ca/policy-and-guidelines/Policy-and-Legal-Framework/Trade-Agreements>

R2710T GENERAL INSTRUCTIONS - CONSTRUCTION SERVICES - BID SECURITY REQUIREMENTS (GI) (2021-04-01)

The following GI's are included by reference and are available at the following Web Site

<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R/R2710T/23>

- GI01 Integrity Provisions - Bid
- GI02 Completion of Bid
- GI03 Identity or Legal Capacity of the Bidder
- GI04 Applicable Taxes
- GI05 Capital Development and Redevelopment Charges
- GI06 Registry and Pre-qualification of Floating Plant
- GI07 Listing of Subcontractors and Suppliers
- GI08 Bid Security Requirements
- GI09 Submission of Bid
- GI10 Revision of Bid
- GI11 Rejection of Bid
- GI12 Bid Costs
- GI13 Procurement Business Number
- GI14 Compliance with Applicable Laws
- GI15 Approval of Alternative Materials
- GI16 Performance Evaluation
- GI17 Conflict of Interest-Unfair Advantage
- GI18 Code of Conduct for Procurement—bid

CONTRACT DOCUMENTS (CD)

1. The following are the Contract Documents:
 - a. Contract Page when signed by Canada;
 - b. Duly completed Bid and Acceptance Form and any Appendices attached thereto;
 - c. Specifications and Drawing;
 - d. General Conditions and clauses

GC1	General Provisions – Construction Services	R2810D	(2017-11-28);
Subsection GC1.22 Performance-evaluation: incorporated by reference above, is amended as follows:			
Delete: in its entirety			
Insert: GC1.22 Intentionally left blank.			
GC2	Administration of the Contract	R2820D	(2016-01-28);
GC3	Execution and Control of the Work	R2830D	(2019-11-28);
GC4	Protective Measures	R2840D	(2008-05-12);
GC5	Terms of Payment	R2850D	(2019-11-28);
GC6	Delays and Changes in the Work	R2860D	(2019-05-30);
GC7	Default, Suspension or Termination of Contract	R2870D	(2018-06-21);
GC8	Dispute Resolution	R2880D	(2019-11-28);
GC9	Contract Security	R2890D	(2018-06-21);
GC10	Insurance	R2900D	(2008-05-12);
	Allowable Costs for Contract Changes Under GC6.4.1	R2950D	(2015-02-25);
 - e. Supplementary Conditions
 - f. Any amendment issued or any allowable bid revision received before the date and time set for solicitation closing;
 - g. Any amendment incorporated by mutual agreement between Canada and the Contractor before acceptance of the bid; and
 - h. Any amendment or variation of the contract documents that is made in accordance with the General Conditions.
2. The documents identified by title, number and date above are incorporated by reference and are set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is available on the PWGSC Web site:
<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>
3. The language of the contract documents is the language of the Bid and Acceptance Form submitted.

SUPPLEMENTARY CONDITIONS (SC)

SC01 SECURITY CLEARANCE REQUIREMENTS, DOCUMENT SAFEGUARDING

There is no document security requirement applicable to this Contract.

SC02 LIMITATION OF LIABILITY

GC1.6 of R2810D is deleted and replaced with the following:

GC1.6 Indemnification by the Contractor

1. The Contractor shall indemnify and save Canada harmless from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings whether in respect to losses suffered by Canada or in respect of claims by any third party, brought or prosecuted and in any manner based upon, arising out of, related to, occasioned by, or attributable to the activities of the Contractor in performing the Work, provided such claims are caused by the negligent or deliberate acts or omissions of the Contractor, or those for whom it is responsible at law.

The Contractor's obligation to indemnify Canada for losses related to first party liability shall be limited to:

- a. In respect to each loss for which insurance is to be provided pursuant to the insurance requirements of the Contract, the Commercial General Liability insurance limit for one occurrence as referred to in the insurance requirements of the Contract .
 - b. In respect to losses for which insurance is not required to be provided in accordance with the insurance requirements of the Contract, the greater of the Contract Amount or \$5,000,000, but in no event shall the sum be greater than \$20,000,000.
2. The limitation of this obligation shall be exclusive of interest and all legal costs and shall not apply to any infringement of intellectual property rights or any breach of warranty obligations.
 3. The Contractor's obligation to indemnify Canada for losses related to third party liability shall have no limitation and shall include the complete costs of defending any legal action by a third party. If requested by Canada, the Contractor shall defend Canada against any third party claims.
 4. The Contractor shall pay all royalties and patent fees required for the performance of the Contract and, at the Contractor's expense, shall defend all claims, actions or proceedings against Canada charging or claiming that the Work or any part thereof provided or furnished by the Contractor to Canada infringes any patent, industrial design, copyright trademark, trade secret or other proprietary right enforceable in Canada.
 5. Notice in writing of a claim shall be given within a reasonable time after the facts, upon which such claim is based, became known.

SC03 INSURANCE TERMS

1) Insurance Contracts

- (a) The Contractor must, at the Contractor's expense, obtain and maintain insurance contracts in accordance with the requirements of the Certificate of Insurance. Coverage must be placed with an Insurer licensed to carry out business in Canada.
- (b) Compliance with the insurance requirements does not release the Contractor from or reduce its liability under the Contract. The Contractor is responsible for deciding if additional insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any additional insurance coverage is at the Contractor's expense, and for its own benefit and protection.

2) Period of Insurance

- (a) The policies required in the Certificate of Insurance must be in force from the date of contract award and be maintained throughout the duration of the Contract.
- (b) The Contractor must be responsible to provide and maintain coverage for Products/Completed Operations hazards on its Commercial General Liability insurance policy, for a period of six (6) years beyond the date of the Certificate of Substantial Performance.

3) Proof of Insurance

- (a) Before commencement of the Work, and no later than thirty (30) days after contract award, the Contractor must deposit with Canada a Certificate of Insurance on the form attached herein.
- (b) Upon request by Canada, the Contractor must provide originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the Certificate of Insurance.

4) Insurance Proceeds

In the event of a claim, the Contractor must, without delay, do such things and execute such documents as are necessary to effect payment of the proceeds.

5) Deductible

The payment of monies up to the deductible amount made in satisfaction of a claim must be borne by the Contractor.

SC04 TYPES AND AMOUNTS OF CONTRACT SECURITY

Remove and Replace GC9.2.2. with the following

A performance bond (form PWGSC-TPSGC 505) and a labour and material payment bond (form PWGSC-TPSGC 506) referred to in subparagraph 1)(a) of GC9.2 shall be in a form and be issued by a bonding or surety company (see Treasury Board Appendix L, Acceptable Bonding Companies) that is approved by Canada. They can be in the form of Signed and Sealed paper version OR electronic digital version.

Electronic digital versions must meet the following;

1. A performance bond and a labour and material payment bond may be submitted in an electronic or digital format if it meets the following criteria:
 - 1.1. The versions submitted by the Contractor must be verifiable by Canada with respect to the totality and wholeness of the bonds form, including: the content; all digital signatures; all digital seals; with the Surety Company, or an approved verification service provider of the Surety Company.
 - 1.2. The versions submitted must be viewable, printable and storable in standard electronic file formats compatible with Canada, and in a single file. Allowable formats include pdf.
 - 1.3. The verification may be conducted by Canada immediately or at any time during the life of the bonds and at the discretion of Canada with no requirement for passwords or fees.
 - 1.4. The results of the verification must provide a clear, immediate and printable indication of pass or fail regarding Item 1.1.
2. Bonds failing the verification process will NOT be considered to be valid.

SPECIFICATIONS AND DRAWING

SPECIFICATIONS FOR

ROOF REPLACEMENT

BUILDING 74
CENTRAL EXPERIMENTAL FARM
OTTAWA, ONTARIO

Prepared for:



**Agriculture and
Agri-Food Canada**

**Agriculture et
Agroalimentaire Canada**

CEF Integrated Services / Services Intégrés de la FEC
Office Address / Adresse du Bureau
Neatby Building, Rm. 1127
Ottawa, Ontario K1A 0C6
Attn.: Michael Dicembre

Project: CEF20 0008
FSA Project: 20158DO-BLDG 74

December 2023

Division	Section	Title	Pages
Division 01	General Requirements		
	01 00 11	General Requirements.....	5
	01 35 29.06	Health and Safety Requirements	4
Division 06	Wood, Plastics and Composites		
	06 10 53	Miscellaneous Rough Carpentry	4
Division 07	Thermal and Moisture Protection		
	07 31 13	Asphalt Shingles	7
	07 52 00	Modified Bituminous Membrane Roofing.....	20
	07 62 00	Sheet Metal Flashing and Trim	6
	07 92 00	Joint Sealants	4

Drawings

- A1 – Roof Plan
- A2 – Details
- A3 – Details
- A4 – Details
- A5 – Details

END OF SECTION

Part 1 General

1.1 GENERAL DESCRIPTION OF THE WORK

- .1 Work to be carried out under this Contract, Roof Replacement, Building 74, at the Central Experimental Farm, Ottawa, Ontario.
- .2 Provide the necessary labour and materials to complete the removal of the existing roofing systems, existing curbs, sheet metal flashings and membrane down to the existing structural deck and install new roofing system as specified herein.
- .3 The new roof systems and roof related accessories shall be as specified and indicated on the drawings.
- .4 Supply and installation of related rough carpentry at parapets and curbs.
- .5 Supply and install all sheet metal caps, counter flashings, scuppers, torch stops, fascia and all other roof related metal flashings required to complete roof installation.
- .6 Supply and installation of all sealants required to seal the transition of membrane and related metal detailing and the termination of sheet metal and non-membrane surfaces.
- .7 Supply and installation of new snow guards as specified and indicated on the drawings.
- .8 Supply and installation of new lightning protection system as specified and detailed. New system to be certified upon completion.
- .9 Supply and installation of required access scaffolding, hording, fencing and overhead protection as required to comply with the Ministry of Labour Health and Safety requirements.

1.2 DEFINITIONS

- .1 "CONSTRUCTOR" and "CONTRACTOR" are synonymous.

1.3 OTHER CONTRACTORS

- .1 Other Contractors, Sub-Contractors and the Departmental Representative's own forces, may be performing work on the site at the same time as the Work is being done under this Contract. The successful bidder shall provide all reasonable co-operation and collaboration with these other forces to ensure a timely completion of the work, taking into consideration and without undermining its own role as the "Constructor".

1.4 USE OF THE SITE

- .1 Carry out the Work so as to have the least possible interference and disturbance to the normal use of the premises. The successful bidder is expected to include in the bid an allowance for the performance of off-hours work should it be required to conform with the above.
- .2 Maintain services to existing building and provide for personnel and vehicle access.

- .3 Restrict construction access to and from site to approved location. Do not allow construction traffic to block entrances or exits for any reason.
- .4 Co-ordinate any interference with Departmental Representative 's operation in this area and abide by Departmental Representative 's direction in this regard. In cases of conflicting requirements, Departmental Representative 's operation takes precedence but all reasonable effort to accommodate Contractor's needs will be made.

1.5 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
- .2 Remove abandoned service lines within 2.4 m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.
- .3 Services are to be left operational unless otherwise authorized by Departmental Representative.
- .4 Unless otherwise specified, the Contractor will be responsible for disconnection, relocation, re-installation and extending all services required to facilitate work under this Contract. Co-ordinate work with the Departmental Representative and provide minimum 48 hours notification if services are to be interrupted.

1.6 CUTTING AND PATCHING

- .1 Generally patch and "make good" any and all surfaces cut, damaged, exposed, or disturbed to comply with any appropriate statutory requirements and to the Departmental Representative 's acceptance.

1.7 PROTECTION OF PROPERTY

- .1 Protect surrounding private and public property from damage during the performance of the Work.
- .2 Be responsible for damage incurred.

1.8 PRECONSTRUCTION CONDITIONS

- .1 Prior to commencing mobilization, the Contractor shall record preconstruction conditions by photographing all items that could potentially be claimed by the Departmental Representative as damaged during the course of the work.
- .2 These items should include adjacent wall areas, landscaping, pavement, windows, paint finishes and any roof top equipment on or adjacent to the subject roof.
- .3 In the event that the Contractor is permitted to store materials or equipment on adjacent roofs or use adjacent roofs to access the subject roofs, these areas shall also be reviewed for preconstruction damage and photographed.
- .4 Provide Departmental Representative with photographic record of preconstruction photographs a minimum of 24 hours prior to commencing mobilization.

- .5 All such damages observed during final or post construction review that cannot be verified as pre-existing, are potentially considered the Contractor's responsibility to rectify.

1.9 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during the performance of the Work as required by insurance companies and governing codes, regulations and by-laws having jurisdiction.
- .2 Work requiring the generation of open flames (welding, soldering, etc...) cannot be performed until an Departmental Representative's Permit has been issued. It is the responsibility of the successful bidder to apply for here said permit.
- .3 Open fires and burning of rubbish are not permitted on site.

1.10 OCCUPATIONAL HEALTH AND SAFETY

- .1 Follow the Ontario Provincial Occupational Health and Safety Act and Regulations for Construction Projects. For the purposes of the act, the person or company contracted to carry out the work shall be deemed the "**Constructor**".
- .2 Hazardous materials, not identified by the Departmental Representative, may be encountered at the worksite. Use all necessary precautions when handling such material. It is possible that asbestos may exist in some form and if encountered the Contractor is responsible to notify the Departmental Representative and to follow Ontario Ministry of Labour regulations governing the handling of asbestos in the workplace.
- .3 The Departmental Representative may cause those who do not comply with the O.H.S.A. and Regulations to be escorted from the site.
- .4 Temporary overhead protection will be required at ground street level sidewalks, where pedestrians are walking. All entrances shall have overhead protection. Additional protection will also be required to prevent material from falling to the street from overhead scaffold platforms.

1.11 PROTECTION OF BUILDING FINISHES AND EQUIPMENT

- .1 Prevent movement, settlement, or other damage to other adjacent structures, utilities, and parts of building to remain in place. Provide bracing and shoring if required.
- .2 Keep noise, dust, and inconvenience to occupants to a minimum.
- .3 Protect building systems, services and equipment. Protect all furnishings within work area with (6 mil) polyethylene film during construction. Remove film during non-construction hours and leave premises in clean, unencumbered and safe manner for normal daytime function.
- .4 Provide temporary dust tight screens, partitions, covers, railings, barricades, supports and/or other protection as required. Protect workers, finished areas of work and public.

1.12 PARKING

- .1 Parking is available on site.

- .2 All vehicles must be parked in designated parking areas (except for reasonable loading and unloading of equipment and/or materials to a local entrance).

1.13 SIGNS AND ADVERTISEMENTS

- .1 No signs or advertisements of any description other than notices regarding safety shall be displayed at the Work Site without permission of the Departmental Representative.
- .2 Upon completion of the Work, all signs shall be removed except those specifically directed by the Departmental Representative to remain.

1.14 CLEAN-UP

- .1 Maintain the work area in tidy condition, free from the accumulation of waste products and debris.
- .2 Remove waste and materials regularly so as to maintain a tidy work site. Do not dispose of any waste in the Departmental Representative's facilities unless specifically directed to do so by authorised personnel.
- .3 Store materials in areas specially designated by the Departmental Representative. Dispose of this debris in a legal manner so as to avoid causing a hazard to occupants and visitors on site.

1.15 MATCHING

- .1 Where new work occurs in or adjacent to existing work, it is the intent that colours and textures of visible finishes within these areas shall be matched to the satisfaction of the Departmental Representative.

1.16 PERMITS, FEES, CERTIFICATES

- .1 Obtain and pay for all required permits.
- .2 Arrange and pay for all inspection certificates required by Authorities having jurisdiction, (i.e., Electrical Safety Authority Certificate). Provide the Departmental Representative with copies of these certificates upon completion.

1.17 DISRUPTION OF SERVICES

- .1 The Contractor is responsible to provide adequate written notice to the Departmental Representative of any interruption of services (i.e., mechanical, electrical etc.) for the connection of new services or the alteration of existing.
- .2 The Contractor is expected to co-operate reasonably with the Departmental Representative in the scheduling of service interruptions.

1.18 SANITARY FACILITIES

- .1 Temporary sanitary facilities will be provided by the Constructor in compliance with the Occupational Health and Safety Act and Regulations for Construction Projects.

1.19 POWER

- .1 Contractor to supply their own power.

1.20 WATER SUPPLY

- .1 Water supply is available at no cost. Connection and disconnection will be at Contractor's expense and liability.

1.21 TEMPORARY FACILITIES

- .1 Any temporary facilities provided at the site by the Contractor must be removed upon completion of the work and the area used must be returned to the original condition.

1.22 DOCUMENTS REQUIRED

- .1 Maintain at the job site, one copy each of the following:
 - .1 Original Plans and Specifications and completed Form of Tender.
 - .2 Building Department stamped drawings if required.
 - .3 Any changes to Drawings or Details.
 - .4 Shop Drawings and any changes.
 - .5 Addenda.
 - .6 Change Orders.
 - .7 Site Instructions.
 - .8 Contractor's Safety Policy.
 - .9 Safety Data Sheets.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Ontario
 - .1 Occupational Health and Safety Act Projects, R.S.O. 1990, c.0.1, as amended and Regulations for Construction O. Reg. 213/91 as amended.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .2 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to authority having jurisdiction, daily / weekly, Departmental Representative.
- .3 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .4 Submit copies of incident and accident reports.
- .5 Submit WHMIS 2015 SDS - Safety Data Sheets.
- .6 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 21 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 2 days after receipt of comments from Departmental Representative.
- .7 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.

- .2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location and not the entire complex. Contractor shall provide a written acknowledgement of this responsibility with 3 weeks of contract award. Contractor to submit written acknowledgement to WSIB along with Notice of Project.
- .3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.4 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.5 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.6 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.7 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.
- .3 Contractor shall be the Principal Contractor as described in the Ontario Health and Safety Act for the Construction for only their scope and areas of work as defined and described in this project specification.
- .4 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.8 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.

- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.9 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.
- .2 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Health and Safety co-ordinator / Safety Officer and follow procedures in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.10 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - .1 Have site-related working experience specific to activities associated with roofing operations.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work and report directly to and be under direction of Registered Occupational Hygienist / Certified Industrial Hygienist / site supervisor.

1.11 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.12 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.13 POWDER ACTUATED DEVICES

- .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.14 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 07 31 13 - Asphalt Shingles.
- .2 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .3 Section 07 92 00 – Joint Sealants.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A653/A653M-19, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 CSA International
 - .1 CSA A123.22-08 (R2018) - Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - .2 CSA O141-05 (R2019), Softwood Lumber.
 - .3 CSA O151-17, Canadian Softwood Plywood.
- .3 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2017.

1.3 QUALITY ASSURANCE

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: by grade mark in accordance with applicable CSA Standards.

1.4 PRECAUTIONS

- .1 Provide temporary protection, to the satisfaction of the Departmental Representative, to render all wood blocking watertight, if for any reason permanent membrane protection cannot be provided within the same day. Ensure the base of any curbs are temporarily sealed to prevent water from entering below the curb assembly, or behind sheathing, should the roof assembly not be completed on the same day as the carpentry work.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and acceptance requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

- .3 Storage and handling requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store materials off ground with moisture barrier at both ground level and as a cover forming a well-ventilated enclosure, with drainage to prevent standing water.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 LUMBER MATERIAL

- .1 Lumber: Unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
 - .1 CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Furring, blocking, nailing strips, grounds, rough bucks, curbs, fascia backing and sleepers:
 - .1 S2S is acceptable for all surfaces.
 - .2 Board sizes: "Standard" or better grade.
 - .3 Dimension sizes: "Standard" light framing or better grade.
 - .4 Post and timbers sizes: "Standard" or better grade.

2.2 PANEL MATERIALS

- .1 Canadian softwood plywood (CSP): to CSA O151.
 - .1 Urea-formaldehyde free.

2.3 FASTENERS

- .1 Wood to wood fasteners: Wood screw #12 or as indicated, galvanized flat head, of sufficient length to completely penetrate through base minimum 25 mm.
- .2 Plywood to concrete, brick or hollow masonry fasteners: 6 mm diameter screws. Length to provide minimum 32 mm and maximum 40 mm embedment into substrate as required. Type to be approved subject to results of pull tests.
- .3 Exposed fasteners for metal to wood or masonry: Use #10 cadmium plated hex screws with neoprene and steel washers. Minimum length 38 mm. Use lead shields, as required for anchoring. Colour of screw head to meet approval of Departmental Representative.
- .4 Nails, spikes and staples: To CSA B111.

2.4 ACCESSORIES

- .1 Metal closure: 0.56 mm (26 ga.) galvanized steel unless otherwise shown or specified.
- .2 Self-adhered membrane: To CSA A123.22, self-adhering membrane consisting of SBS rubberized asphalt compound laminated to a polyethelene film. Minimum thickness 1 mm.
- .3 Semi-rigid insulation: semi-rigid mineral wool, rockwool, or slagwool boards, to CAN/ULC S702.2.

2.5 FINISHES

- .1 Galvanizing: To ASTM A653/A653M, use galvanized fasteners for all work.

Part 3 Execution

3.1 GENERAL INSTALLATION

- .1 Extend air/vapour barrier seals up vertical surfaces and curbs and onto the deck as shown on the Drawings, to provide continuity.
- .2 Slope the top of all wood blocking at the roof perimeter in towards the roof at a minimum of 5%, unless otherwise shown on the Drawings.
- .3 Comply with requirements of NBC, supplemented by the following paragraphs.
- .4 Install furring and blocking as required to space-out and support wall and ceiling finishes, facings, fascia, soffit, siding and other work as required.
- .5 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .6 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .7 Install wood, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.

3.2 SECUREMENT OF WOOD BLOCKING

- .1 Comply with more stringent requirements as required by drawings or Ontario Building Code requirements. Increase number and spacing of all fasteners by 50% for 2400 mm from all outside roof corners.
- .2 Install fasteners to the design intent to hold all wood blocking permanently in place to prevent warping, deflection and to resist all wind and weather conditions.
- .3 Secure wood to concrete in a staggered pattern with each row spaced at minimum 600 mm c/c with specified fasteners. Drill holes 13 mm deeper than depth of fastener penetration.

- .4 Install fasteners in two rows in the direction of the grain, offset one to another in a staggered fashion by approximately 50%. All fasteners shall be placed minimum 10 mm from any edge of framing.
- .5 Unless specified otherwise, the number of fasteners shall be doubled at all outside parapet corners, for a distance of 3 m from the corner.
- .6 For any exposed fastening, provide touch-up paint as required to coat all exposed surfaces of screws damaged during the driving process.

3.3 SHEATHING INSTALLATION

- .1 Plywood:
 - .1 Not less than 2 mm gaps shall be provided between sheets, to allow for material expansion.
 - .2 Unless otherwise indicated, fasten plywood with a minimum of thirty-six fasteners per 1200 mm x 2400 mm sheet.

3.4 ERECTION

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink bolts where necessary to provide clearance for other work.
- .3 Bevel leading edge of wood panel products on vertical applications to facilitate membrane installation and as detailed on drawings.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .2 Section 07 92 00 – Joint Sealants.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A653/A653M-19, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
- .3 Canadian Roofing Contractors' Association (CRCA)
 - .1 CRCA Roofing Specifications Manual
- .4 CSA International
 - .1 CSA A123.5-16, Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules.
 - .2 CSA A123.22-08(R2018), Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - .3 CSA A123.51-14(R2018), Asphalt Shingle Application on Roof Slopes 1:6 and Steeper.
 - .4 CAN/CSA B72-M87 (R2013) Installation Code for Lightning Protection Systems.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS 2015)
 - .1 Safety Data Sheets (SDS).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt shingles and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit proof of manufacturer's CCMC listing and listing number.
 - .3 Manufacturer's Instructions: to indicate special handling criteria, installation sequence, cleaning procedures and storage.
 - .4 Submit 2 copies of WHMIS 2015 SDS.
- .2 Samples:
 - .1 Submit duplicate samples of full size specified shingles.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and acceptance requirements: Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .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 Remove only in quantities required for same day use.
 - .3 Store and protect asphalt shingles from nicks, scratches, and blemishes.
 - .4 Replace defective or damaged materials with new.

1.5 EXTRA STOCK MATERIALS

- .1 All unused shingles remain property of the Departmental Representative.

1.6 WARRANTY

- .1 Contractor's Warranty for Labour and Material:
 - .1 For Work of this Section 07 31 13 – Asphalt Shingles, 12 months warranty period is extended to 60 months.
 - .2 Make all necessary repairs and replacements within 48 hours of receipt of written notification.
 - .3 Nothing contained in this Article shall be construed as in any way restricting or limiting the liability in common law and statutory liability of the Contractor.
 - .4 Provide these written warranties, confirming above, issued on the corporate letterhead, signed and sealed by an authorized signing officer. The warranties will specifically reference the name of the Building, location and Departmental Representative.
- .2 Manufacturer's Warranty:
 - .1 Provide a 40-year shingle warranty.

Part 2 Products

2.1 MATERIALS

- .1 Fibreglass asphalt shingles: To CSA A123.5 with a 40-year manufacturer's warranty.
 - .1 Type: self-sealing, glass fiber mat base, ceramically colored/UV resistant mineral surface granules across entire face of shingle; algae-resistant, two piece laminated architectural shingle.
 - .2 Colour: As selected from manufacturer's standard range by Client.
- .2 Starter Strip:

- .1 Starter strip shall consist of a 3-tab shingle placed upside down, with self-adhering strip placed along the leading edge and tabs removed.
- .3 Underlayment:
 - .1 Synthetic underlayment, made of spun-bonded polypropylene, vapour permeable.
- .4 Asphaltic cement:
 - .1 Plastic cement: To CAN/CGSB-37.5.
 - .2 Lap cement: To CAN/CGSB-37.4.
- .5 Nails: galvanized steel, sufficient length to penetrate 19 mm into deck.
- .6 Eave protection membrane: To CSA A123.22, modified bitumen based, self-adhering, minimum thickness 1 mm.
- .7 Plumbing vent flashing: Neoprene boot flashing, sized to suit vent stack, with 400 mm x 400 mm neoprene flange, sized to suit vent diameter.
- .8 Mineral wool insulation: To CAN/ULC S702.1, Type 1, preformed, unfaced.

2.2 FASTENERS

- .1 Nails and staples to be long enough to penetrate decking a minimum of 19 mm.

2.3 ACCESSORIES

- .1 Metal closure: 0.56 mm (26 gauge) galvanized steel unless otherwise shown or specified.
- .2 Spray-in-place polyurethane foam insulation: Thickness as shown or specified to CAN/ULC S705.1 Materials and CAN/ULC S705.2 Application.
- .3 Semi-rigid mineral wool insulation: Semi-rigid glass fibre, rockwool, or slagwool boards, to CAN/ULC 702.2.

2.4 STATIC VENTS

- .1 Comprised of prepainted metal with a clear venting space of 61 square inches, with slant back profile for steep roofs crush and dent resistant.

2.5 LIGHTNING PROTECTION CONDUCTOR ATTACHMENT

- .1 Components to lightning protection system shall comply with CAN/CSA B72-M87 Installation Code for Lightning Protection Systems.
- .2 Include for all copper/brass base plates, anchorage, straps, rods and connectors to reinstate the lightning protection system to comply with CAN/CSA B72-M87 and provide copy of certification prior to contract close-out.

2.6 SHEET METAL ROOFING MATERIALS (APRON)

- .1 As shown on drawings, fabricate from 0.51 mm (26 ga.) steel to ASTM A653 Grade 230 with G90 zinc coating. Surface coated with Perspectra Series baked enamel finish. Colour to be selected by owner from manufacturer's standard colour range.
 - .1 Panel profile shall be a 38 mm rib at 406 mm c/c with intermediate ribs.
 - .2 Hidden fastener installation.
 - .1 Standard of acceptance:
 - .1 "Heritage (HF) profile", by Ideal Roofing.
 - .2 Or accepted alternate.

2.7 SNOW GUARDS

- .1 Snowguard locations are as indicated on the drawings.
- .2 Pre-painted galvanized metal standing seam clamping system c/w 2-tier continuous tubing and intermediate clip, as recommended by the manufacturer. System to be supplied with all components required for installation including seam clamps, tubing, end caps, fasteners, etc.
 - .1 Standard of acceptance:
 - .1 "DualGard" c/w S-5-S clamps and accessories, by Metal Roof Innovations, Ltd.
 - .2 Or accepted alternate.

Part 3 Execution

3.1 REMOVAL OF EXISTING ROOFING

- .1 Remove existing roofing, flashings and underlay, and expose roof sheathing.
- .2 Withdraw existing shingle and flashing nails. Set those which break off flush with wood deck. Leave surfaces free from dirt and loose material.

- .3 Remove portions of sheathing affected by fungal or insect attack as directed on site by Departmental Representative.
- .4 Remove all metal flashing, step flashing and plumbing vents flashing as per specification. Retain for re-use only where indicated.
- .5 Remove all existing static vents as per specification.
- .6 Remove all exhaust vents, carefully detaching interior ducts and ensure ducts are adequately anchored to substrate.

3.2 EXAMINATION

- .1 Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt shingles installation in accordance with manufacturer's written instructions.
 - .1 Visually review substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.3 EAVES PROTECTION AND UNDERLAYMENT APPLICATION

- .1 Install 1 ply self-adhering waterproof membrane to all eaves extending 1.8m up slope and all valleys 1.8m wide and at the transition of all sloped and vertical surfaces as indicated on detail drawings.
- .2 Membrane shall be laid flat following removal of release paper and be free of wrinkles, buckles and fishmouths. Ensure membrane laps are all sealed with the upper ply lapped over the lower roll width by 75mm and with 150mm end laps.
- .3 Install membrane at all changes in plane to extend 300mm up vertical and 600mm onto sheathing.
- .4 Install two roll widths of membrane at all valleys, centred on middle of valley.
- .5 Install underlayment sheeting to all other sheathing surfaces, ensuring all laps are in direction of drainage plane. Nail in place until shingle application commences. Do not allow underlayment to provide overnight waterproof protection without receiving permission from Departmental Representative.

3.4 SHINGLE APPLICATION

- .1 Do asphalt shingle work to CSA A123.51 and CRCA Specification except where specified otherwise.
- .2 Nailing and staples: All fasteners shall be driven straight to the achieve a flush finish. Where fasteners are under driven, the contractor shall return and correct by hand nailing. Where fasteners are over driven or installed crookedly, the contractor shall be requested to return and replace the affected shingles.
- .3 Install drip edge metal flashing along eaves, overhanging 12 mm, with minimum 100 mm flange extending onto roof decking. Nail to deck at 300 mm on centre.

- .4 Install step flashing interleaved between shingles at vertical junctions. Install metal step flashing, extending 100 mm up vertical face and 100mm out onto deck. Provide a minimum headlap of 75 mm for each step flashing. Install shingles over flange of the step flashings. Terminate shingles flush with vertical face.
- .5 Install asphalt shingles on roof slopes 1:6 and steeper in accordance with CSA A123.51.
- .6 Install a starter strip at the eave, rakes and valleys and extend 13mm beyond eave and rake edges. Nails should be installed in a parallel line to base of roof. Nails should be arranged so as not to be left exposed by the cut outs or spaces between shingles tabs. Install starter strip so that self-adhering strip is located at the extreme edge of the roof and faces upward.
- .7 Install the first course of shingles starting with a full shingle overhanging the eave and rake edges by 19 mm.
- .8 Install a minimum of 4 nails per shingle, located as indicated on the shingle packaging. For high wind areas or in cool temperatures, or on slopes of 21:12 (60°) or more, use 6 nails per shingle placed as shown below. Ensure that no nail is within 50 mm of a joint/cutout of the underlying shingle. Seal down each shingle at time of application with three 25 mm diameter spots of roofing cement placed under the shingle 50 mm above the bottom edge and equally spaced along the shingle. Use roofing cement sparingly, as excessive amounts may cause blistering.
- .9 Install the second course of shingles by cutting half the tab off the first shingle. Then alternate this with a full shingle for succeeding course.
- .10 For Architectural Laminated Shingles: Follow manufacturer's specific application requirements for the selected shingle. Generally, this will include trimming off 250 mm, 500 mm and 750 mm respectively, from the left end of the starting shingle and apply to overhang rake edge by 7 mm to 19 mm. Continue each course across the roof with full shingles butting ends loosely. Align the bottom edge of the shingles with the tops of the saw teeth of the shingles in the underlying course. Note: Other offsets between 150 mm – 250 mm may be used. Repeat the sequence of the first four courses up the roof.
- .11 Apply shingles so as to avoid colour blending problems.
- .12 Hip and Ridge Shingles: The contractor shall install precut shingles unless the manufacturer does not fabricate this product. Pre-cut Hip and Ridge products bend each piece over the hip or ridge, and nail per instructions on the wrapper. The final shingle should be set in roofing cement and the exposed nail heads of this shingle should be covered with roofing cement. Prior to application in cold weather, store hip and ridge shingles in a heated area to allow for easier bending.
- .13 In high wind areas: Starter strip shingles must be used at all eaves and rakes. The shingles must be installed with additional nails as specified and they must

have an opportunity to seal or be manually sealed as described. Manual sealing in addition to 6 nails is required.

3.5 METAL APRON INSTALLATION

- .1 Panels and trim: Comply with manufacturer's instructions for assembly, installation and erection for weather tight installation.
 - .1 Install according to approved shop drawings.
 - .2 Install panels in accordance with manufacturer's instructions and recommendations. Anchor securely in place using clips and fasteners spaced in accordance with manufacturer's recommendations for design wind load criteria. Fasteners are to penetrate roof structure below sheathing.
 - .3 Comply with methods and recommendations of CRCA for flashing configurations required.
 - .4 Discrepancies between job site conditions and shop drawings shall be brought to the attention of the Consultant for resolution.
 - .5 Cutting and fitting:
 - .1 Cut panels neat, square, and true with shearing action cutters. Torch or power saw cutting is prohibited.
 - .2 Openings 150 mm and larger: Shop fabricate and reinforce to maintain original load capacity.
 - .3 Openings less than 150 mm: Field cutting is acceptable.
 - .6 Dissimilar metals or materials:
 - .1 Where panel or trim may come in contact with dissimilar metals or treated lumber, fabricate transition to facilitate drainage and minimize possibility of galvanic action. Galvanic action can cause panels and trim to fail prematurely.
 - .2 At points of contact with dissimilar metal or treated lumber, coat panel and trim with protective paint or separate materials with a weatherproof underlayment.
 - .3 Form seams in the direction of water-flow and make watertight.

3.6 PLUMBING VENT FLASHING

- .1 Install new neoprene sleeves over existing vents.
- .2 Ensure flange is laid flat and conical portion is stress free and not distorted.

3.7 STATIC VENTS

- .1 Install vents in strict accordance with manufacturers printed instructions. Ensure vents are located in the same areas as the existing and increase opening size to accommodate the larger vent.
- .2 At vent locations, ensure vent opening is cut to match size of vent and does not restrict airflow. Brace openings as required to ensure a suitable substrate for vent unit.

- .3 Install vent flange to sit on shingles below openings and nail to substrate on top and sides. Shingles shall terminate at sides of vent, leaving approximately 25mm clearance around upstand.

3.8 CLEANING

- .1 Leave Work area clean at end of each day.
- .2 Use tarps at ground level to collect debris and remove by end of each day.
- .3 Sweep ground areas with a drag magnet at regular intervals to ensure all nails are removed.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.9 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by asphalt shingles installation.

END OF SECTION

Part 1 General

1.1 GENERAL

- .1 Contractor to provide an original, complete insurance policy identifying specific coverage for torch applied systems.

1.2 RELATED SECTIONS

- .1 Section 06 10 53 – Miscellaneous Rough Carpentry.
- .2 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .3 Section 07 92 00 – Joint Sealants.

1.3 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A653/A653M-19, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA A123.23-15, Product specification for polymer-modified bitumen sheet, prefabricated and reinforced.
 - .2 CSA B272-93 (R2000), Prefabricated Self-Sealing Roof Vent Flashings.
- .3 Factory Mutual (FM Global)
 - .1 Hot Work Permit Form F2630.
 - .2 FM 4450, Approval Standard for Class 1 Insulated Steel Roof Decks.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Convene pre-installation meeting one week prior to beginning roofing Work, with roofing contractor's representative and Departmental Representative to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.

1.5 COORDINATION

- .1 Coordinate work of this Section with related work specified in other Sections to ensure construction schedule is maintained and water tightness and protection of the building and finished work is maintained at all times.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 System summary:

- .1 Provide a one page synopsis of each roof type that lists the assembly components in order from top to bottom.
- .2 Product Data:
 - .1 Provide two copies or an electronic copy of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations for all products to be incorporated in the new system.
 - .2 Provide two copies or an electronic copy of WHMIS 2015 Safety Data Sheets to Departmental Representative for:
 - .1 Primers.
 - .2 Sealers.
 - .3 Liquid membrane.
 - .4 Adhesives.
- .3 Provide shop drawings:
 - .1 Indicate sloped insulation layout and details.
 - .2 Provide shop drawing or submittal indicating adhesive pattern specified by adhesive manufacturer for the required wind uplift pressures indicated on the Drawings.
- .4 Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.7 QUALITY ASSURANCE

- .1 Installer qualifications: Company or person specializing in application of modified bituminous roofing systems with 5 years documented experience, approved by manufacturer. Installer to be members of Ontario Industrial Roofing Contractors Association (OIRCA) and/or Canadian Roofing Contractors' Association (CRCA) in good standing.
- .2 Only certified applicators are permitted to use torch welding equipment.
- .3 Hold a pre-installation meeting prior to the start of roofing works, with the roofing contractor's representative and the Departmental Representative, to review installation conditions particular to this project.

1.8 FIELD QUALITY CONTROL

- .1 Water Testing:
 - .1 In the event the Departmental Representative deems any of the Work to be deficient, provide water test of all flashing, projections, equipment on roof and roofing system. Co-ordinate test with the Departmental Representative's operations personnel.
 - .2 Contractor is to assume all costs of testing and correction.
- .2 Adhesion Testing:

- .1 If requested by the Departmental Representative, at each roof drainage area, following installation of membrane base sheet, carry out adhesion tests to confirm adhesion of membrane to substrate and substrate layers to each other, down to first mechanically attached layer.
 - .2 Locations and timing of tests will be directed by Departmental Representative. Provide labour and materials as required to assist Departmental Representative in conducting tests.
 - .3 If inadequate adhesion is found, conduct further testing to determine the extent of the inadequate adhesion. Replace all defective areas to the satisfaction of the Departmental Representative. Replace substrate materials as necessary with new materials, and patch cut tests with membrane patches extending at least 150 mm beyond the cut.
 - .4 Contractor is to assume all costs of testing and correction.
- .3 Sample Testing:
- .1 If requested by the Departmental Representative, at each roof drainage area, following installation of membrane base sheet, carry out sample tests to confirm materials and installation of roof assembly components. Sample size to be 300 mm x 300 mm.
 - .2 Locations and timing of tests will be directed by Departmental Representative.
 - .3 If inadequate construction is found, conduct further testing to determine the extent of the inadequate adhesion. Replace all defective areas to the satisfaction of the Departmental Representative. Replace substrate materials as necessary with new materials, and patch cut tests with membrane patches extending at least 150 mm beyond the cut.
 - .4 Contractor is to assume all costs of testing and correction.

1.9 FIRE PROTECTION

- .1 Fire Extinguishers:
 - .1 Pressure rechargeable type with hose and shut-off nozzle,
 - .2 ULC labeled for ABC class protection.
 - .3 ULC labeled for A class protection, for wood, paper and fibreboard.
 - .4 Size 14 kg.
 - .5 Have one fully charged ABC extinguisher and one fully charged Type A extinguisher on roof per torch applicator, within 3 m of the propane source.
- .2 Maintain fire watch for 2 hours after each day's torching operations cease.

1.10 GENERAL REQUIREMENTS

- .1 Comply with the General Requirements, General Instructions and Supplementary Conditions.
- .2 Execute work in accordance with this Section and other related Sections, Drawings and Details.

- .3 Attach roofing to structure to meet requirements of insurance underwriter and authorities having jurisdiction.
- .4 Regard manufacturer's printed recommendations as minimum requirement for materials, methods and workmanship not otherwise specified.
- .5 Contact the Departmental Representative if the specifications conflict with the manufacturer's recommendations. Otherwise it will be assumed that the Contractor and manufacturer are in agreement with procedures outlined.
- .6 Advise the Departmental Representative of adjustments to specified roofing procedures caused by weather and site conditions. Make adjustment to specified procedures only after review with the Departmental Representative.
- .7 Maintain equipment in good working order to ensure control of roofing operations and protection of work. Types of roofing equipment and laying techniques to be employed are to meet the approval of the Departmental Representative.
- .8 All temporary drains shall be connected with a mechanical connection (MJ coupling) or a U-flow connection, until new drains are installed.

1.11 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS 2015) regarding use, handling, storage, and disposal of, sealing compounds, primers and caulking materials.
- .3 Manufacturer's recommendations for handling and storing products are to be considered a minimum requirement.
- .4 Materials shall be delivered to the site, undamaged and in their original packages, with manufacturer's labels visible, attesting to their conformity to specific standards.
- .5 Ensure that shelf life of materials has not expired.
- .6 Remove damaged material from site and replace all rejected materials with new product.
- .7 Elevate on raised platform and store as to prevent deformation of materials.
- .8 Provide and maintain dry, off-ground weatherproof storage.
- .9 Store rolls of membrane in upright position. Store membrane rolls with selvage edge up.
- .10 Remove only in quantities required for same day use.

- .11 Place plywood runways over completed Work and over areas not in Contract, as required, to enable movement of material and other traffic.
- .12 Store sealants at +5°C minimum.
- .13 Protect insulation by slitting manufacturer's packaging and installing a waterproof UV-resistant tarp.
- .14 Handle roofing materials in accordance with manufacturer's written directives, to prevent damage or loss of performance.
- .15 Avoid stockpiling of materials or use of equipment on decks in a way which could cause overloading.

1.12 ENVIRONMENTAL REQUIREMENTS

- .1 Ensure protection of products that are sensitive to damage by moisture. Do not work during rain, snow or fog. Stop work and make watertight before the onset of inclement weather or when weather appears imminent.
- .2 Ensure protection of the building from weather at all times. If inclement weather is forecast or appears imminent, postpone work that would risk the building from moisture damage.
- .3 If it becomes apparent that work would threaten the building watertightness, the Departmental Representative has the right to stop work. Any additional expenses due to work stoppage or postponement of work will be at the Contractor's expense.
- .4 Ambient Conditions
 - .1 Do not install roofing when ambient temperature remains below -18°C for torch application.
 - .2 Minimum ambient temperature for solvent-based adhesive is -5°C.
- .5 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

1.13 COMPATIBILITY

- .1 Compatibility between materials is essential. Use only materials that are known to be compatible when incorporated in a complete assembly. Provide written declaration to Departmental Representative stating that materials and components, as assembled in system, meet this requirement.
- .2 Defective work resulting from work with incompatible materials will be considered the responsibility of the Contractor.
- .3 Repair all work that could result in damage or interfere with performance.

1.14 EXISTING SUBSTRATES

- .1 Following removal of existing material to the substrate, inspect the deck for soundness and notify the Departmental Representative of any deck found unsound and not suitable for roofing. Do not commence work until conditions are documented and the Departmental Representative rules on the acceptability of surfaces and/or corrective measures required. The cost of any delays due to postponement of work that results from investigating the site problem or obtaining a ruling will be at the Departmental Representative's expense.
- .2 The commencement of work is proof that the Contractor has accepted surfaces as satisfactory and accepts responsibility for appearance and performance of completed work.
- .3 Defective work resulting from application of material on unsatisfactory surfaces will be considered the responsibility of the Contractor.
- .4 The Contractor will be responsible for all repairs, costs and pay all cost and fees required to rectify damage or defective work. Use materials and finish to match the original preconstruction conditions.

1.15 DAILY OPERATIONS

- .1 Unless otherwise specified, complete the entire roofing operation up to line of termination of each day's work, as required by design intent, in order to safeguard and protect the work and building from damage and weather.

1.16 EXAMINATION

- .1 Before proceeding with roofing application, ensure that:
 - .1 All surfaces are clean and free of debris, snow, frost and moisture.
 - .2 The deck is clean and sufficiently dry to ensure specified adhesion will be obtained.
 - .3 Adjacent construction and installation of related work (i.e. curbs, drains, penetrations, wood nailers, etc.) incorporated with the roof are complete.
 - .4 Roof deck is sound, existing fasteners are tight and irregularities are corrected to provide a suitable surface for new roofing.
- .2 Ensure substrate is smooth. Remove sharp edges or protrusions that could impair the function of the roof assembly.
- .3 Inform Departmental Representative in writing of any defects.

1.17 DRAINS AND DRAINAGE PLANE

- .1 Inspect surfaces and ensure that roof deck is level or sloped to drains in conforming to design intent.
- .2 Inspect surfaces and ensure that roof drains are set at a level to drain and are connected or capped.

- .3 Take spot levels to verify that pools of water in excess of 13 mm depth will not form.
- .4 Tabulate levels and submit to Departmental Representative.
- .5 Ensure plumbing is accessible and work can be completed as specified.
- .6 Inspect roof drains to ensure they are open and working properly.
- .7 Where specified or shown for areas with only one drain, provide overflow scuppers or drains to detail and specified requirements.

1.18 EQUIPMENT

- .1 Inspect equipment affected by the work, including but not limited to rooftop equipment, curbs, existing drains and plumbing, mechanical, electrical and lightning protection services, to ensure they are in good repair and working order. Record any damage and advise the Departmental Representative.
- .2 During re-roofing, ensure that all mechanical equipment, ducts, pipes, etc. are properly supported.
- .3 Notify Departmental Representative of any equipment which is not operational or damaged prior to the commencement of work.

1.19 ADVISE DEPARTMENTAL REPRESENTATIVE

- .1 Advise the Departmental Representative of any unusual circumstances affecting the work. Notify the Departmental Representative of any defective or malfunctioning equipment or drainage deficiencies. Do not commence work until defects and incorrect levels have been verified and rectified.

1.20 PROTECTION OF ROOFTOP EQUIPMENT

- .1 Remove any equipment and flashing intended for re-use and save from harm. Store in approved location and reset at project conclusion unless specified or shown to be removed.
- .2 Protect all openings, vents and stacks from weather and contamination from debris.
- .3 Provide temporary plumbers plugs to protect drains during roofing operations. Ensure that temporary protection is removed at completion of work period and/or at the end of each days work.

1.21 SERVICES

- .1 Services are to be left operational unless otherwise authorized by the Departmental Representative.
- .2 Unless otherwise specified, the Contractor will be responsible for disconnection, relocation, re-installation and extending all services required to facilitate work

under this Contract. Co-ordinate work with the Departmental Representative and provide minimum of 48 hours notification if services are to be interrupted.

- .3 Contractor to verify location of services prior to commencement of work. Notify Departmental Representative of any unusual conditions.
- .4 The Contractor and their employees must hold valid certificates for the work undertaken.
- .5 Complete work of this Section as required by local authorities having jurisdiction. Have work inspected and pay all fees relative to such inspection to ensure work meets with published standards and codes.
- .6 Submit Certificate or Letter of Approval by authority responsible for the work to the Departmental Representative with final documentation.
- .7 All fans, air handling units, and any electrical equipment affected by the replacement of the roof sections under this Section, whether disconnected or extended must be inspected by an ESA representative to verify the integrity of the existing wiring and/or the new installation.

1.22 WARRANTY

- .1 Contractor's Warranty for Labour and Material:
 - .1 For Work of this Section 07 52 00 - Modified Bituminous Membrane Roofing, 12 months warranty period is extended to 24 months.
 - .2 Make all necessary repairs and replacements within 48 hours of receipt of written notification.
 - .3 Nothing contained in this Article shall be construed as in any way restricting or limiting the liability in common law and statutory liability of the Contractor.
 - .4 Provide these written warranties, confirming above, issued on the corporate letterhead, signed and sealed by an authorized signing officer. The warranties will specifically reference the name of the Building, location and Departmental Representative.
- .2 Manufacturer's Warranty:
 - .1 Provide a 10-year membrane warranty.

Part 2 Products

2.1 GENERAL

- .1 All standards, regulations and specifications listed herein are considered to be the latest available edition.

2.2 PRIMERS

- .1 Asphalt Primer: To manufacturer's recommendations.

- .2 Self-adhesive membrane primer. As recommended by membrane manufacturer. Use low VOC, polymer emulsion-based primer, unless directed otherwise by Departmental Representative on site.

2.3 MEMBRANE AND MEMBRANE FLASHINGS

- .1 Acceptable membrane manufacturers:
 - .1 Soprema.
 - .2 IKO Industries Ltd.
 - .3 Henry Bakor.
 - .4 Johns Manville.
- .2 Base sheet membrane and base sheet membrane flashing (non-combustible substrates): To CSA A123.23.
 - .1 Styrene-butadiene-styrene (SBS) elastomeric polymer polyester or composite polyester/fibreglass reinforcement.
 - .2 Type B or Type C.
 - .3 Grade 2.
 - .4 Top and bottom surfaces:
 - .1 polyethylene/polyethylene.
- .3 Cap sheet membrane and membrane flashing: To CSA A123.23.
 - .1 Styrene-butadiene-styrene (SBS) elastomeric polymer, prefabricated sheet, polyester or composite polyester/fibreglass reinforcement.
 - .2 Type B or Type C.
 - .3 Grade 1, granule surfaced.
 - .1 Colour for granular surface: Gray.
 - .4 Grade 1-standard service.
 - .5 Bottom surface polyethylene.

2.4 LIQUID MEMBRANE

- .1 Two-component methacrylate or one component polyurethane/bitumen resin, solid content 80% or greater, compatible with roof membrane.
- .2 Reinforcement mesh: As recommended by liquid membrane manufacturer.

2.5 SEALERS

- .1 Plastic cement: Asphalt, to CAN/CGSB-37.5.
- .2 For sealants, mastic, adhesives or caulk, refer to Section 07 92 00 – Joint Sealants.

2.6 PLUMBING VENTS

- .1 2-piece spun aluminum with integral flange, diameter to suit existing pipe size.

2.7 ROOF ACCESSORIES

- .1 Bituminous metal paint: To isolate metal from concrete and masonry surfaces, to CAN/CGSB-1.108-M89 Type II.

Part 3 Execution

3.1 QUALITY OF WORK

- .1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual.
- .2 Do priming in accordance with manufacturer's written recommendations.
- .3 Fit the interface of all walls and roof assemblies with durable rigid material sheet metal or plywood providing connection point for continuity of air barrier.
- .4 Make assembly, component and material connections in consideration of appropriate design loads, with reversible mechanical attachments.
- .5 In the event that any product contains a manufacturing defect or anomaly, the Contractor shall notify the Departmental Representative and manufacturer immediately and request direction.

3.2 REMOVAL OF EXISTING ROOFING

- .1 Leave existing roofing in place. Replace all metal flashings including vent flashings. Power wash and prime existing membrane surface.

3.3 EXAMINATION OF ROOF DECKS

- .1 Verification of Conditions:
 - .1 Inspect with Departmental Representative deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed.
- .2 Evaluation and Assessment:
 - .1 Prior to beginning of work ensure:
 - .1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris. Do not use calcium or salt for ice or snow removal.
 - .2 Curbs have been built.
 - .3 Roof drains have been installed at proper elevations relative to finished roof surface.
 - .4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.
- .3 Do not install roofing materials during rain or snowfall or when such weather is imminent.

3.4 PROTECTION OF IN-PLACE CONDITIONS

- .1 Cover walls, walks and adjacent work where materials hoisted or used.
- .2 Use warning signs and barriers. Maintain in good order until completion of Work.
- .3 Protect roof from traffic and damage. Comply with precautions deemed necessary by Departmental Representative.
- .4 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed Work and materials out of storage.
- .5 Metal connectors and decking will be treated with rust proofing or galvanization.
- .6 Fit the interface of the walls and roof assemblies with durable rigid material sheet metal or plywood providing connection point for continuity of air barrier.

3.5 PRIMING

- .1 Unless otherwise indicated or directed by Departmental Representative, prime all surfaces which will be in direct contact with bituminous materials at the rate of 0.15 L/m² to manufacturer's recommendations. For self-adhering membrane, install primer at a rate recommended by manufacturer. Ensure that surfaces are tack-free before proceeding.
- .2 Limit quantity of primer at deck openings and points of termination and provide supplemental protection to prevent bleedthrough to the building interior.
- .3 Roll primer into surface.
- .4 Re-prime all surfaces, including pre-primed surfaces, that become contaminated with dust or become marred due to their exposure to roof traffic or weather.

3.6 MODIFIED BITUMINOUS MEMBRANE - GENERAL APPLICATION

- .1 Inspect and seal all substrates to eliminate fire hazard. Use fireguard tape as required or recommended by manufacturer.
- .2 Mechanical spreaders are not permitted to install modified membranes.
- .3 Use only bitumen, sealants, adhesive or mastics as specified by membrane manufacturer. Provide written approval from manufacturer when proposing any alternatives or substitutions.
- .4 Lay out all sheets as to allow them to relax a minimum of 30 minutes. When temperatures are below 4.4°C keep and lay out rolls in heated storage. Install rolls before temperature fallback of the sheet occurs.
- .5 Roof membrane to be installed in one sheet if possible.

- .6 Lay all membrane starting at low point to ensure that seams do not face water flow. Roll all membrane into place, true to line, free of buckles, air pockets, fishmouths and tears.
- .7 Overlap all end laps minimum 150 mm and side laps 75 mm.
- .8 Offset all side laps between plies by 50%.
- .9 Offset all end laps between plies minimum 1200 mm.
- .10 At valley locations, run membrane continuously with the slope of the main roof. Lay out all sheets to ensure minimum side laps are maintained through valley area and short section of roof beyond. At these locations the side laps for the main roof will increase. Install membrane to details and Departmental Representative's direction onsite.
- .11 Ensure that a watertight seal is achieved at all overlaps and points of termination.
- .12 Carry base sheet flashing over face of building as shown on the drawings.
- .13 Carry membrane up all vertical surfaces to point shown. Cut off corners at 45° at end laps to be covered by the next roll prior to installation of following sheet.
- .14 Verify procedure with Departmental Representative on site. Seal fasteners through membrane immediately with Type 'A' sealant.
- .15 Do not walk on membrane during applications and until sufficient cooling has taken place as to allow for traffic without doing damage or marking surface.

3.7 BASE SHEET (TORCH APPLICATION)

- .1 Install 1-ply base sheet membrane running with the roof slope, starting at the low point. Layout roll in place to verify alignment and proper overlap and re-roll prior to torching.
- .2 Fully torch in place base sheet membrane using proper application techniques as specified by membrane manufacturer.
- .3 Install membrane true to line and free of wrinkles, air pockets, voids, excessive bitumen flow or other irregularities. Ensure the membrane is not overheated at any location. Should any of these conditions occur, immediately stop membrane application and correct the deficiency before proceeding. Notify Departmental Representative and obtain his approval for proposed repair methods. Questionable areas will require to be cut out and replaced.
- .4 Ensure that a watertight seal of all membrane joints and points of termination is achieved with a torch and trowel.
- .5 Terminate base sheet up all verticals 50 mm, secure on vertical with membrane fastening bar and fasteners @ 150 mm c/c.

- .6 Review base membrane for low areas (ponding) and correct with additional base sheet membrane.

3.8 BASE SHEET FLASHINGS (TORCH APPLICATION)

- .1 All flashings to be cut across the roll in 1 m sections. Cut off corners at end laps to be covered by next flashing piece.
- .2 Provide chalk lines and install all membrane true to line. Install gusset reinforcement pieces at all corner locations.
- .3 Commence flashings from the drain or low points and overlap all side laps minimum 75 mm. Base sheet flashings to extend 100 mm onto roof surface and terminate as shown in drawings.
- .4 Install membrane by softening both contact surfaces simultaneously with recommended torching equipment. During application, unroll membrane slowly into fluid bitumen ensuring consistent 6 mm flow protrudes each side of the roll.
- .5 Unroll and work sheet into place using torch, trowel and wet sponge to ensure proper placement and adhesion.
- .6 Install membrane true to line and free of wrinkles, air pockets, voids, excessive bitumen flow or other irregularities. Ensure the membrane is not overheated at any location. Should any of these conditions occur, immediately stop membrane application and correct the deficiency before proceeding. Notify Departmental Representative and obtain his approval for proposed repair methods. Questionable areas will require to be cut out and replaced.

3.9 CAP SHEET (TORCH APPLICATION)

- .1 Prior to installation, unroll the cap sheet and check for granular embedment width and alignment.
- .2 Layout membrane to ensure side lap of cap sheet does not occur within 150 mm of roof drain.
- .3 Install specified cap sheet membrane running with the roof slope, starting at the low point. Layout roll in place to verify alignment and proper overlap and re-roll prior to torching. Offset cap sheet side laps 50% to base sheet side laps, ensure lap does not lie within 150 mm of a roof drain.
- .4 Install 1-ply cap sheet membrane full torched in place using proper application techniques as specified by the membrane manufacturer.
- .5 Install membrane by softening both contact surfaces simultaneously with recommended torching equipment. During application, unroll membranes slowly into fluid bitumen ensuring consistent 3 mm to 6 mm flow protrudes each side of the roll.
- .6 Install membrane true to line and free of wrinkles, air pockets, voids, excessive bitumen flow or other irregularities. Ensure the membrane is not overheated at

any location. Should any of these conditions occur, immediately stop membrane application and correct the deficiency before proceeding. Notify Departmental Representative and obtain his approval for proposed repair methods. Questionable areas will require to be cut out and replaced

- .7 Using a torch and trowel, embed granules at end laps and where required on surface of cap sheet to ensure proper bonding of membrane overlaps.

3.10 CAP SHEET FLASHINGS (TORCH APPLICATION)

- .1 All flashings to be cut across the roll in 1 m sections. Cut off corners at end laps to be covered by next flashing piece.
- .2 Provide chalk lines and install all membrane true to line. Install base sheet gusset reinforcement at all corner locations.
- .3 Commence flashings from the drain or low points and overlap all side laps minimum 75 mm. Cap sheet flashings to extend 150 mm onto roof surface and terminate as shown in drawings. At wall locations, unless otherwise specified, cap sheet flashings to extend up 50 mm higher than base sheet flashings.
- .4 Where required by Summary of Work and details, install 50 mm wide continuous strip of Type 'A' sealant to the tops of parapets or eaves to prevent bitumen spillage on the building exterior.
- .5 Install membrane by softening both contact surfaces simultaneously with recommended torching equipment. During application, unroll membrane slowly into fluid bitumen ensuring consistent 6 mm flow protrudes each side of the roll.
- .6 Unroll and work sheet into place using torch, trowel and wet sponge to ensure proper placement and adhesion.
- .7 Install membrane true to line and free of wrinkles, air pockets, voids, excessive bitumen flow or other irregularities. Ensure the membrane is not overheated at any location. Should any of these conditions occur, immediately stop membrane application and correct the deficiency before proceeding. Notify Departmental Representative and obtain his approval for proposed repair methods. *Questionable* areas will require to be cut out and replaced.
- .8 Touch up bare spots, corners, scuffs and bleedout runs on cap sheet with granules matching membrane colour, immediately following installation. Use hot air welder, torch or Type 'A' sealant to adhere granules to sheet.

3.11 PLUMBING VENTS, STACKS AND SLEEVES

- .1 Inspect and clean soil pipes of debris to ensure they are operational.
- .2 Protect exposed surface during roofing operation and clean surfaces free of bitumen before leaving site.

- .3 Make all penetrations air and watertight at air/vapour barrier by installing self-adhesive membrane flashings 150 mm onto air/vapour barrier and carry up and around projection. Clamp in place and caulk.
- .4 Trim base sheet at roof projections.
- .5 Adjust existing pipes to new flashing heights by either cutting down or extending pipes with matching materials attached with mechanical couplers. Ensure pipes are 38 mm higher than flashing to allow for sealing to prevent condensation.
- .6 Clear all projections free of contaminants and seal junction of base sheet and roof projections with trowel applications of sealant as shown on drawings.
- .7 Install all metal flanges to be built into the membrane before the installation of cap sheet. Insulate sleeves in accordance with drawings as specified. Where required, install telescoping caps to detail.
- .8 Prime topside and underside of all flanges to be incorporated with roofing prior to application. Use primer supplied by the membrane manufacturer. All primer to be dry before installation of membrane roofing or flashing.
- .9 Before installing flashings, install 1-ply base sheet extending to opening. Set flanges in bed of Type 'A' sealant prior to membrane installation, as per manufacturer's recommendations.
- .10 Install 1-ply of base sheet flashings thermofused to the flange to within 25 mm from upturn and continuing a minimum of 225 mm beyond flange. Continue cap sheet to metal upturn. Seal around upturn junction with sealant and touch up with matching granules, as per manufacturer's recommendations.

3.12 LIQUID MEMBRANE FLASHING

- .1 Using a slow-speed mechanical agitator, thoroughly mix the entire container of resin for two minutes before the addition of catalyst. Pour the resin into a second container if you make a batch mix. Add pre-measured catalyst to the resin component according to the amounts indicated in manufacturer's Catalyst Mixing Chart. Add catalyst only to the amount of material that can be used within 10 to 15 minutes. Stir again for two minutes before applying.
- .2 Apply the first resin layer to the substrate using rollers, brushes or notched squeegees provided for this purpose. The thickness of the first layer must be 1.3 mm to 1.5 mm when wet.
- .3 Lay out the polyester reinforcement on the resin to prevent the formation of wrinkles, swellings or fishmouths.
- .4 Use rollers, brushes or notched squeegees in order to fully saturate resin reinforcement and remove wrinkles and air bubbles under the reinforcement. The appearance of the reinforcement should be slightly opaque without any white trace. It is important to correct these defaults before the resin cures.

- .5 Apply the second resin layer on top of the reinforcement using rollers, brushes or notched squeegees provided for this purpose. The second layer thickness must be 0.6 mm to 0.7 mm when wet.
- .6 Excess resin which is not absorbed should be used to saturate adjacent reinforcement.
- .7 The final resin coating should be smooth and even.
- .8 Each reinforcement shall overlap the previous one by 50 mm laterally and by 100 mm at the ends.

3.13 CLEAN UP

- .1 At all times, keep the premises free from accumulation of waste materials or rubbish. Stock piling of debris on the roof will not be permitted.
- .2 Repair defects in surface and bitumen runs with granules to match existing to leave the roof in an even consistent finish.
- .3 Leave roof clear of debris and bitumen left by spills and machine tracking.
- .4 Leave grounds and building free of debris and bitumen spread by pedestrian traffic where applicable.
- .5 Clean surfaces and penetrations of all contaminants and touch up to the satisfaction of the Departmental Representative. Include rooftop equipment, curbs, soil stacks, sleeves, gas lines, vents, drains and ladders.
- .6 Check drains to ensure they are functional and where required remove all debris by vacuum.
- .7 At the completion of the work remove all rubbish, tools, equipment and surplus materials.
- .8 Be responsible to repair and pay all costs and fees required to rectify damage caused by work of the Contract with materials and finish to match original.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 53 – Miscellaneous Rough Carpentry.
- .2 Section 07 92 00 – Joint Sealants.

1.2 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-19, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
 - .1 CSA A123.3-05(R2015), Asphalt Saturated Organic Roofing Felt.
 - .2 CSA A123.22-08(R2018), Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - .3 CAN2-51.32-M77, Sheathing, Membrane, Breather Type.
- .3 Canadian Roofing Contractors Association (CRCA)
 - .1 Roofing Specifications Manual 2012.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS 2015)
 - .1 Safety Data Sheets (SDS).
- .5 Sheet Metal and Air Conditioning Contractors Association of North America (SMACNA)
 - .1 Architectural Sheet Metal Manual

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit to the Departmental Representative a list of materials intended for use before they are ordered.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature including product specifications and technical data sheets for sheet metal flashing fasteners and accessory materials. Include product characteristics, performance criteria, physical size, finish and limitation.
 - .2 Submit copies of WHMIS 2015 SDS - Safety Data Sheets
- .3 Samples:
 - .1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, finishes and colours.

1.4 COORDINATION

- .1 Coordinate work of this Section with Related Work specified in other Sections to ensure construction schedule is maintained and watertightness and protection of the building and finished work is maintained at all times.

1.5 EXAMINATION

- .1 Do not commence work until surface to be covered has been inspected.
- .2 Inspect work and advise the Departmental Representative of conditions that would adversely affect the work of this trade.
- .3 Commencement of work is proof that the Contractor has accepted surfaces as satisfactory for intended operations and accepts responsibility for appearances and performance of completed work.
- .4 Repair damaged and inferior work caused by work of this Contract with materials and finish to match original to the Departmental Representative's approval.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS 2015) regarding use, handling, storage, and disposal of materials.
- .3 Manufacturer's recommendations for handling and storing products are to be considered a minimum requirement.
- .4 Materials shall be delivered to the site, undamaged and in their original packages, with manufacturer's labels visible, attesting to their conformity to specific standards.

Part 2 Products

2.1 GENERAL

- .1 All standards, regulations and specifications listed herein are considered to be the latest available edition.
- .2 Compatibility between materials is essential. Use only materials that are known to be compatible when incorporated in a completed assembly.

2.2 PREFINISHED SHEET METAL FLASHING

- .1 Pre-finished metal flashings: As shown on drawings, fabricate from 0.65 mm (24 ga.) steel to ASTM A653 Grade 230 with G90 zinc coating. Surface with

Perspectra Series baked enamel finish. Colour to match existing from manufacturer's standard colour range.

2.3 PREFINISHED SHEET METAL CLADDING

- .1 Pre-finished steel cladding: Same material as metal flashings, profile to match existing.
- .2 Pre-finished steel cladding: As shown on drawings, fabricate from 0.65 mm (24 ga.) or 0.51 mm (26 ga.) steel to ASTM A653 Grade 230 with G90 zinc coating. Surface with Perspectra Series baked enamel finish. Colour to match existing adjacent construction from manufacturer's standard colour range.
- .3 Cladding sections shall be provided in the maximum length to minimize the number of field laps.

2.4 ACCESSORIES

- .1 Metal cleat: Same material as metal flashings, 50 mm wide @ 600 mm c/c.
- .2 Continuous metal starter strip: 0.71 mm (24 ga.) galvanized steel, secured at 400 mm c/c.
- .3 Use galvanized, copper, aluminum or stainless steel nails or screws as most compatible with materials and preservatives being utilized.
- .4 Nails: Annular threaded nails of length to penetrate into bases minimum 25 mm. No. 8 screws to penetrate wood 19 mm at 600 mm c/c.
- .5 Masonry fasteners: Spike sized to penetrate concrete 38 mm minimum as specified or shown.
- .6 Exposed fasteners: Where exposed fasteners are specified or as shown, use #10 screws with metal and neoprene washers pre-finished to match colour of flashing. Alternatively, use screws with colour match nylon caps where shown or approved by the Departmental Representative.
- .7 Screws for starter strips and fascia: #8 @ 400 mm c/c.
- .8 Wedges: Rolled plumber sheet lead.
- .9 Sealant: Refer to Drawings and Section 07 92 00 – Joint Sealants.
- .10 Weather barrier membrane: Dry sheathing to CAN/CGSB-51.32, No. 15 perforated asphalt felt to CSA A123.3.
- .11 Self-adhered membrane: To CSA A123.22, self-adhering membrane consisting of SBS rubberized asphalt compound laminated to a polyethelene film. Minimum thickness 1 mm.
- .12 Touch-up paint: As recommended by prefinished material manufacturer.

2.5 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable details, as indicated. Where not indicated, follow applicable CRCA 'FL' series details and SMACNA architectural details.
- .2 Metal shall be formed on a bending brake, shaping trimmed and hard seaming shall be done on bench, as far as practicable, with proper sheet metal working tools. Angles of bends and folds for interlocking metal shall be made with full regard to expansion and contraction to avoid buckling and to avoid damaging metal surfaces.
- .3 Fabricate all possible work in shop in maximum 2400 mm lengths by brake forming, bench cutting, drilling and shaping. Match existing profiles where metal flashing is to be repaired.
- .4 Hem exposed edges on underside 13 mm. Mitre and seal corners with sealant.
- .5 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .6 Dry joints are to be tight but not dented so as to permit slight adjustments of sheets and yet remain watertight.
- .7 Lock seams at all corners.
- .8 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.
- .9 Supply all accessories required for installation of sheet metal work of this Section. Fabricate accessories of same material to which they will be used.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 SHEET METAL FLASHING INSTALLATION

- .1 Install sheet metal flashings at copings, walls, expansion joints, roof openings and other components required to protect the membrane flashings as shown on the drawings or otherwise required. Where not indicated, follow applicable CRCA 'FL' series details.
- .2 Install continuous concealed starter strips at all exterior faces. Install cleats between lock joints and as indicated to permanently hold flashing in place. Install hook strip fasteners with 2 fasteners per cleat.

- .3 Sheet metal work shall be installed to cover the entire area it protects and shall be watertight under all service and weather conditions. Install in a uniform manner, true to line, free of dents, warping and distortion.
- .4 Back-paint sheet metal that comes into contact with another kind of metal, masonry or concrete with bituminous paint at the rate of 0.15 L/m².
- .5 Install sheet metal with concealed fasteners at lock joints. Exposed fastening will only be permitted with the approval of the Departmental Representative. When exposed fasteners are shown, space all fasteners evenly in an approved manner. Use lead plugs and screws with neoprene washers where fasteners are exposed, otherwise use concrete drive fasteners where metal flashings are installed over concrete masonry.
- .6 Install weather barrier membrane under sheet metal where indicated.
- .7 Join sheet metal by "S" lock seams, to permit thermal movement. Seal all fasteners and completely fill all joints with Type 'B' sealant as flashing is being installed. Clean off all excessive visible material subsequent to installation.
- .8 When flashing is being installed in more than one piece, offset joints in adjacent flashings by approximately 50%.
- .9 Form inside and outside corners by means of locked seams. Do not use pop rivets unless accepted by Departmental Representative.
- .10 Slope all metal to interior of roof area to maintain slope, unless otherwise indicated. Do not form open joints or pockets that fail to drain water.
- .11 Where existing reglets are to be re-used, remove existing sealant and re-cut to conform to the size requirements specified herein.

3.3 SHEET METAL CLADDING INSTALLATION

- .1 Provide all required accessories to complete the installation at all corners, terminations and projections. Ribs shall be installed horizontally and metal sections shall overlap by a minimum of 150 mm. Use the longest lengths possible to minimize the number of joints.
- .2 Secure Z-girts to existing substrate vertically. Install one Z-girt at the wall head and one at the wall base and at a maximum spacing of 900 mm between bars to provide suitable substrate for cladding and flashing anchorage. Anchor Z-girt to substrate at 300 mm maximum c/c.
- .3 Siding to be secured to Z-girts with self-taping screws complete with neoprene washers. Colour to match siding. Fasteners shall be installed between each rib and at a consistent elevation.
- .4 Install siding in accordance with design intent and as indicated on shop drawings.

- .5 All perimeters shall be covered with specified sheet metal flashing and caulked at termination. Include for all J-trim, U-trim and closures at penetrations and drip edges at base.

3.4 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment. Remove and replace all sheet metal sections that received surface damage or scratches during fabrication, delivery or installation.
- .2 For scratches and scuffs to be retained in the new installation, use touch up paint recommended by the metal material supplier.
- .3 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 53 – Miscellaneous Rough Carpentry.
- .2 Section 07 52 00 - Modified Bituminous Membrane Roofing.
- .3 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .4 Section 22 05 11 – Plumbing and Drainage.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C920-18, Standard Specification for Elastomeric Joint Sealants.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS 2015)
 - .1 Safety Data Sheets (SDS).

1.3 COORDINATION

- .1 Coordinate work of this Section with Related Work specified in other Sections to ensure construction schedule is maintained and watertightness and protection of the building and finished work is maintained at all times.

1.4 EXAMINATION

- .1 Do not commence work until surface to be covered has been inspected.
- .2 Inspect work and advise the Departmental Representative of conditions that would adversely affect the work of this trade.
- .3 Commencement of work is proof that the Contractor has accepted surfaces as satisfactory for intended operations and accepts responsibility for appearances and performance of completed work.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.6 ENVIRONMENTAL AND SAFETY REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS 2015) regarding use, handling, storage and disposal of hazardous materials; and regarding labeling and provision of safety data sheets acceptable to Labour Canada.

- .2 Conform to manufacturer’s recommended temperatures, relative humidity and substrate moisture content for application and curing of sealants including special conditions governing use.
- .3 In confined spaces provide portable supply of outside air and exhaust fans to ensure fumes will not impact workmen or building occupants.
- .4 Compatibility is essential in use of any materials that will be compatible when incorporated in finished assembly.

Part 2 Products

2.1 MATERIALS

- .1 Sealants acceptable for use on this project must be listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants. Where sealants are qualified with primers use only these primers.
- .2 Modified bitumen sealant (Sealant Type ‘A’):
 - .1 For penetration and terminations of bituminous and modified bituminous membrane: As recommended by membrane manufacturer.
- .3 Urethanes one part (Sealant Type ‘B’):
 - .1 Non-sag: To ASTM C920, Type S, Class 25 or higher, use NT.

Type		Use	Movement Capability Class		
S	Single Component	T	Traffic	Class 100/50	100% expansion
M	Multi-Component	NT	Non-traffic		50% compression
Grade		I	Immersed	Class 50	50%
P	Pourable	M	Mortar	Class 35	35%
NS	Non-sag	G	Glass	Class 25	25%
		O	Other	Class 12.5	12.5%

2.2 JOINT CLEANER

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

2.3 PRIMER

- .1 As recommended by sealant manufacturer for specific substrate adhesion.

Part 3 Execution

3.1 PROTECTION

- .1 Protect installed work of other trades from staining or contamination.

3.2 PREPARATION OF JOINT SURFACES

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful substances including dust, rust, oil, grease and other matter, which may impair work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

3.3 APPLICATION

- .1 Sealant - General:
 - .1 Apply sealant when air and substrate temperatures are not forecast to be less than minimum recommended by manufacturer. Do not work during inclement weather. Perform all work in accordance with manufacturer's written instructions.
 - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - .3 Apply sealant in continuous beads.
 - .4 Apply sealant using gun with proper size nozzle.
 - .5 Use sufficient pressure to fill voids and joints solid.
 - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets and embedded impurities.
 - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
 - .8 Remove excess compound promptly as work progresses and upon completion.
 - .9 The use of liquid tooling aids, such as soapy water or alcohols, are prohibited as they may impact effective sealant cure, adhesion and potentially cause aesthetic issues.
- .2 Sealant Type 'A':
 - .1 Install sealant Type 'A' to the top of membrane flashings where required or as shown on drawings. Modified sealant to be installed around finished flashings at all protrusions including soil stacks, sleeves, pitch boxes and fasteners securing membrane to walls.
 - .2 Apply sealant Type 'A' with hand trowel to achieve a 25 mm width and minimum 3 mm thickness.
 - .3 Apply sealant Type 'A' immediately after flashings have been installed and are still warm. No membrane flashings shall be left uncovered at the end of any work period. *(Non-compliance with this mandate may result in*

rejection, removal and replacement of the membrane flashings to the affected area).

- .4 Trowel sealant Type 'A' in two directions to ensure proper adhesion to substrate and that all surface irregularities are filled. Tool surface of modified sealant to smooth finish.
- .5 Install sealant Type 'A' at the underside of drains, metal sleeves and other location where specified on drawings.
- .3 Curing:
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.
- .4 Install sealant Type 'B' at sheet metal terminations.

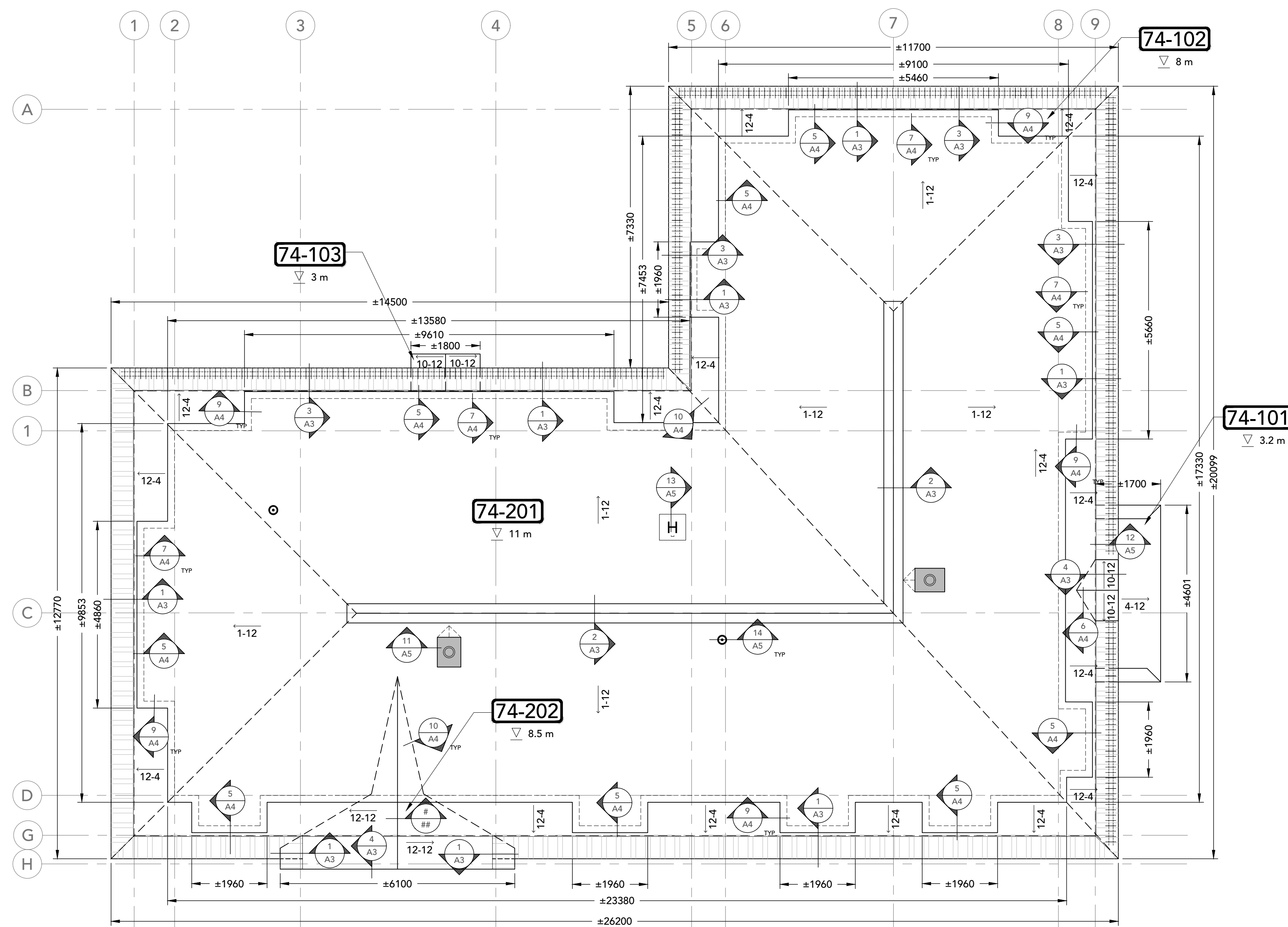
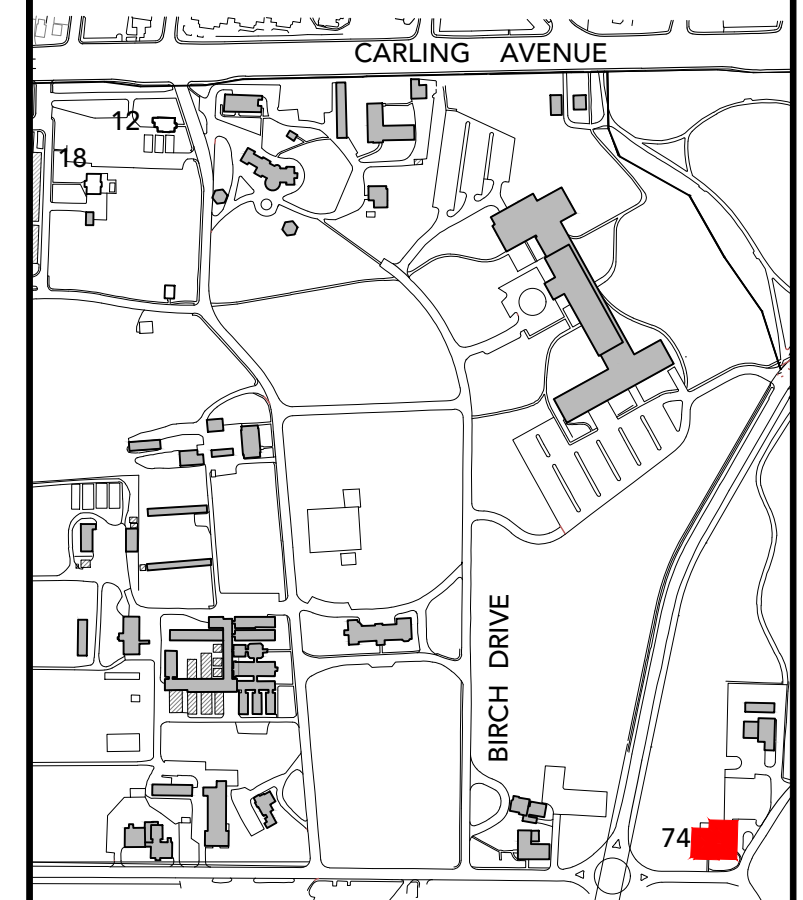
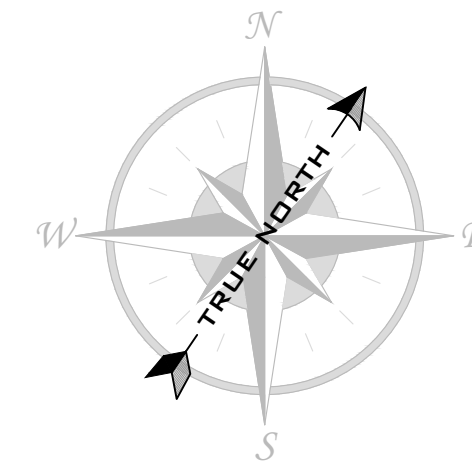
3.4 CLEANING

- .1 Clean adjacent surfaces immediately and leave work neat and clean.
- .2 Remove excess droppings using recommended cleaners as work progresses.
- .3 Remove masking tape after initial set of sealant.
- .4 Clean all contaminated surfaces to Owner's acceptance.
- .5 Remove all rubbish and surplus materials from the job site on a daily basis.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION



ROOF PLAN - BUILDING 74 / PLAN DU TOIT - BÂTIMENT 74
 1:75

LEGEND	
SYMBOL	DESCRIPTION
	CHIMNEY CHEMINÉE
	CRICKET CRICKET
	ICE GUARD GARDE DE GLACE
	PLUMBING VENT ÉVENT DE PLOMBERIE
	ROOF SLOPE PENTE DE TOIT
	ROOF HATCH ÉCOUTILLE DE TOIT
	ROOF NUMBER AND ELEVATION NUMÉRO ET HAUTEUR DU TOIT
	PREFINISHED METAL APRON NAPRON MÉTALLIQUE PRÉFINI

revision	description	date
03	FOR TENDER/ POUR APPEL-D'OFFRE	2023-12-12
02	FOR 99% REVIEW/ POUR RÉVISION DE 99%	2020-08-28
01	FOR 66% REVIEW/ POUR RÉVISION DE 66%	2020-08-21

Do not scale drawings.
 Verify all dimensions and conditions on site and immediately notify the engineer of all discrepancies.

	A Detail No. No. du détail
	B drawing no. - where detail required dessin no. - où détail exigé
	C drawing no. - where detailed dessin no. - où détaillé

project title
 titre du projet
**RÉFECTION DE TOITURE
 ROOF REPLACEMENT, CEF
 BUILDING 74 / BÂTIMENT 74**

drawing title
 titre du dessin
**ROOF PLAN
 PLAN DU TOIT**
 BUILDINGS 12 & 74 / BÂTIMENT 12 ET 74

drawn by
 dessiné par
 ROEL PARKER

designed by
 conçu par
 MICHEL PAULIN

approved by
 approuvé par
 M.P.

tender
 soumission - project manager
 administrateur de projets

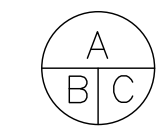
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 2024

project no.
 no. du projet
 CEF20 0008

drawing no.
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revision		date
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**RÉFECTION DE TOITURE
 ROOF REPLACEMENT, CEF
 BUILDING 74 / BÂTIMENT 74**

drawing title
 titre du dessin
**DETAILS
 DÉTAILS**

drawn by
 dessiné par **ROEL PARKER**

designed by
 conçu par **MICHEL PAULIN**

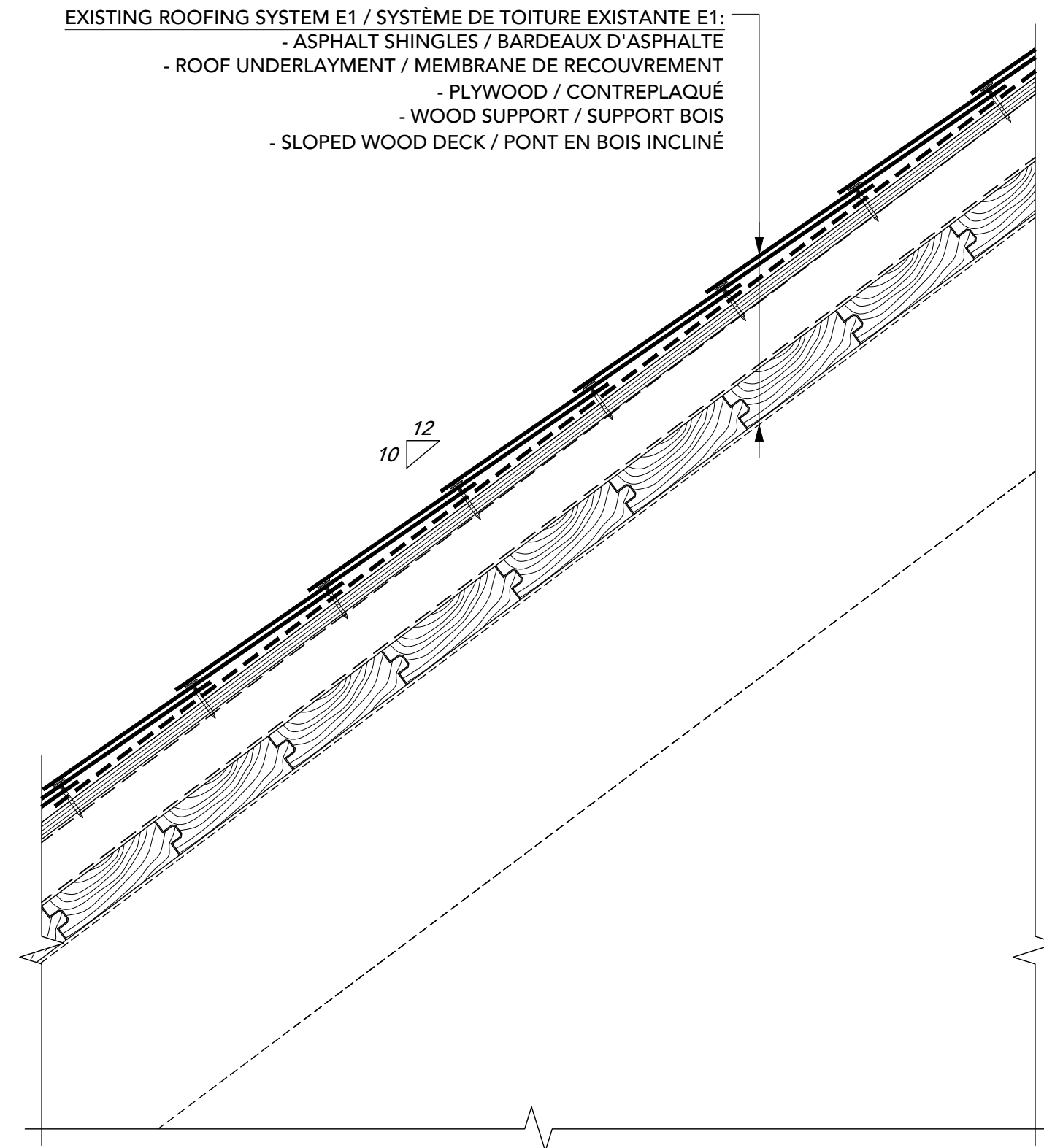
approved by
 approuvé par **M.P.**

tender
 soumission - project manager
 administrateur de projets

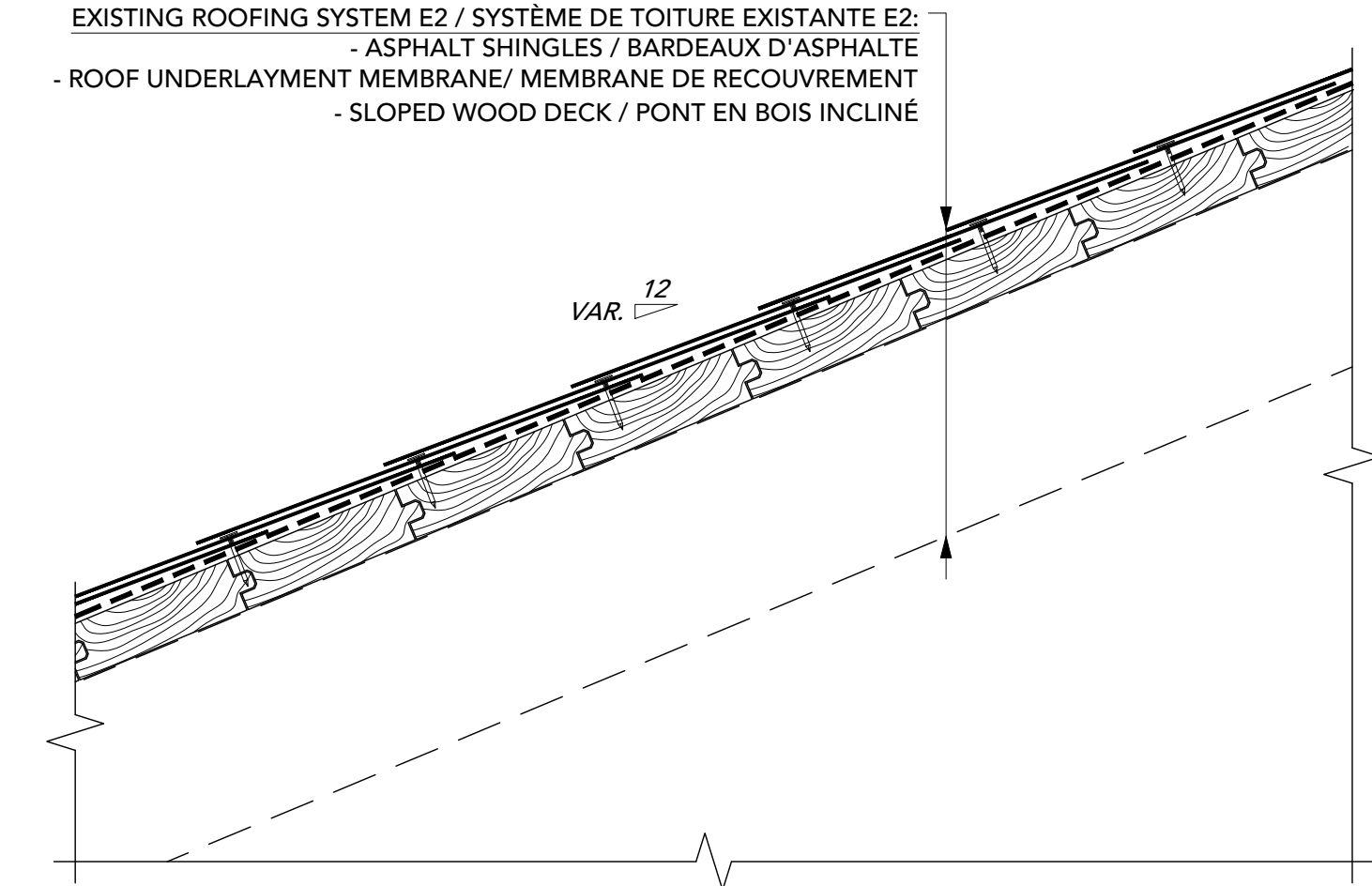
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project no.
 no. du projet **CEF20 0008**

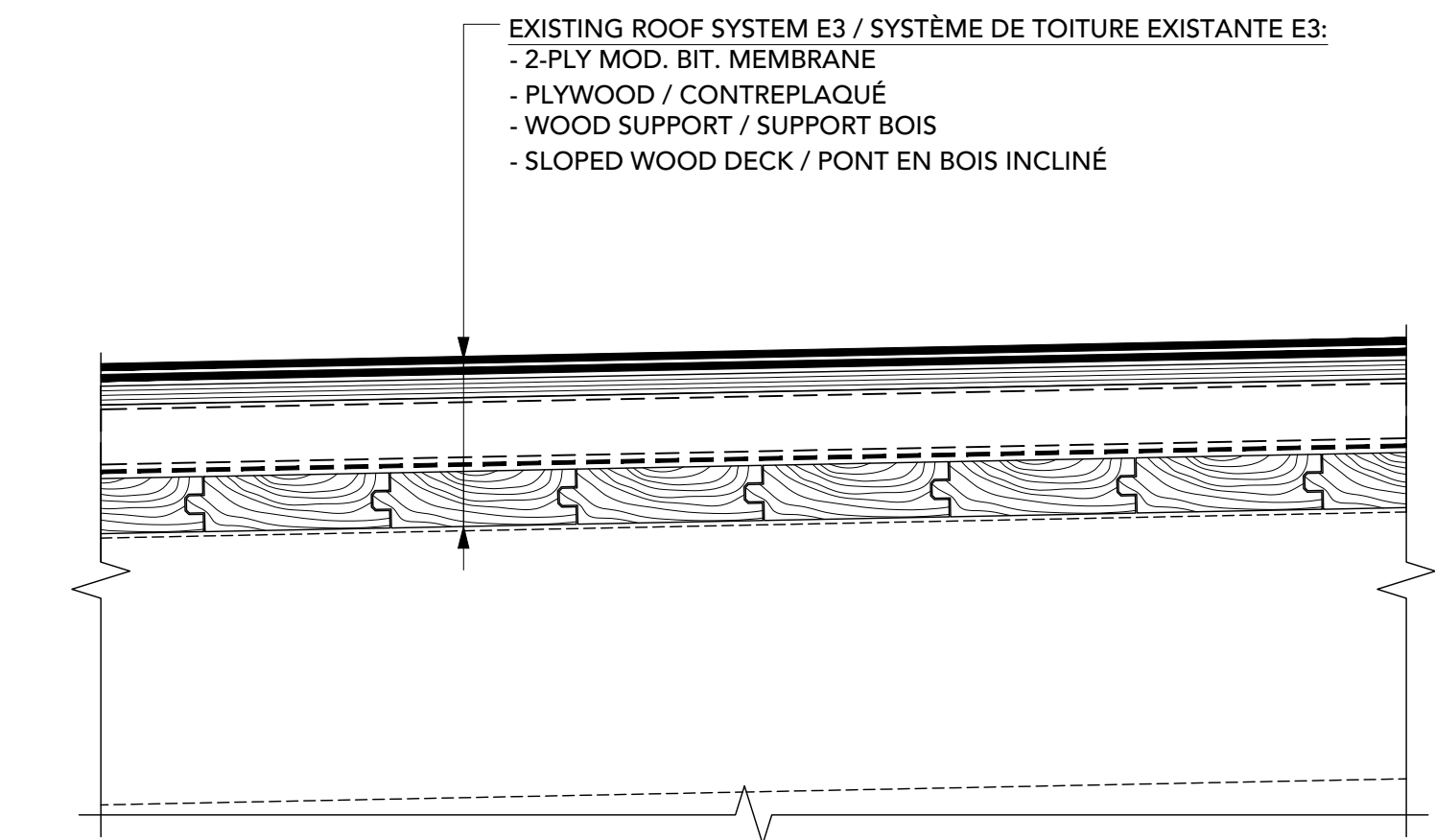
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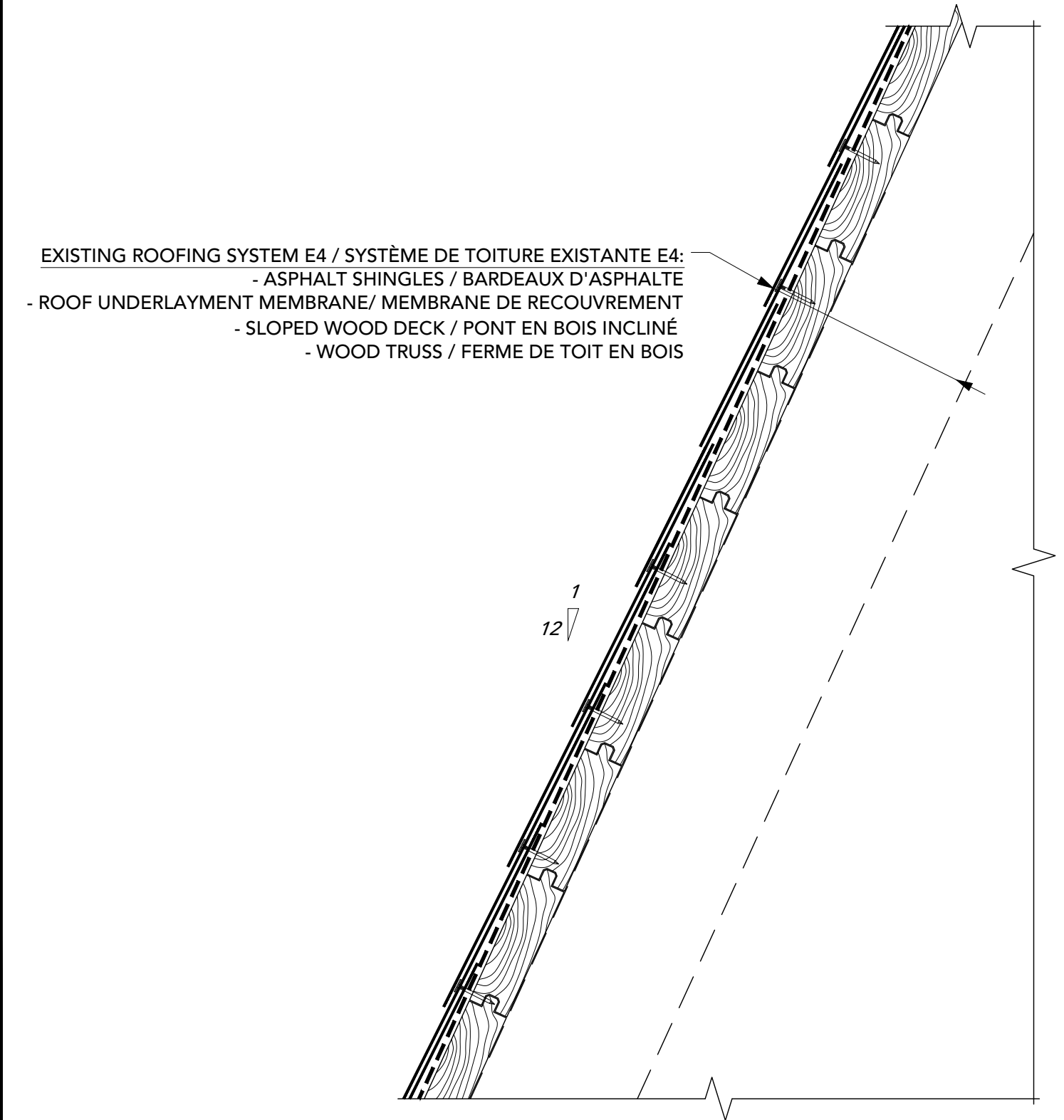
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A2 1:5 ROOF AREA 74-202 / BASSIN 74-202



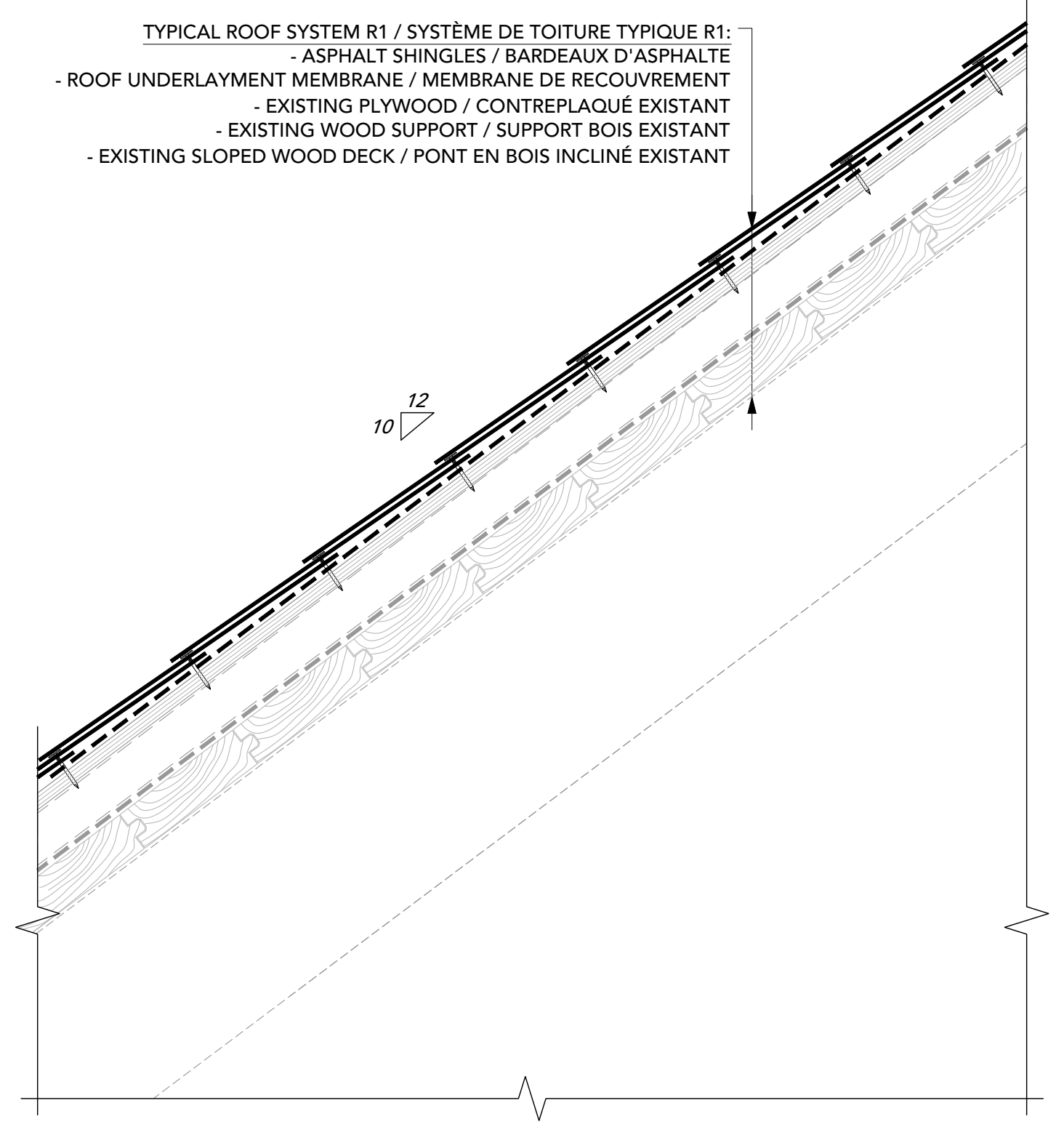
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A2 1:5 ROOF AREAS 74-101 & 74-103 / BASSINS 74-101 ET 74-103



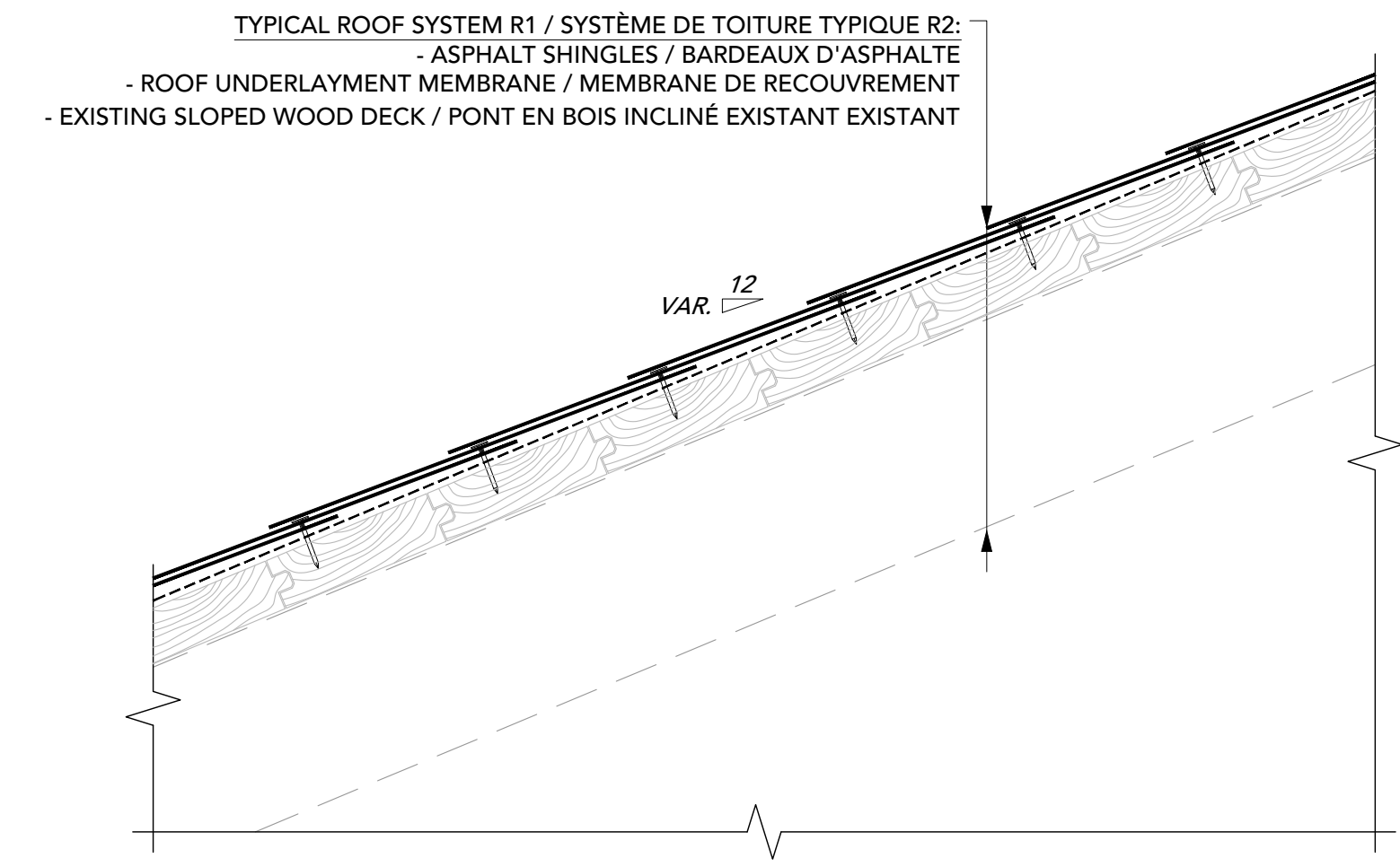
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A2 1:5 ROOF AREA 74-201 / BASSIN 74-201



E4 EXISTING ROOFING SYSTEM E4 / SYSTÈME DE TOITURE EXISTANTE E4
A2 1:5 ROOF AREA 74-102 / BASSIN 74-102



R1 TYPICAL ROOF SYSTEM R1 / SYSTÈME DE TOITURE TYPIQUE R1
A2 1:5 ROOF AREA 74-202 / BASSIN 74-202



R2 TYPICAL ROOF SYSTEM R1 / SYSTÈME DE TOITURE TYPIQUE R2
A2 1:5 AREAS 74-101 & 74-103 / BASSINS 74-101 ET 74-103

03	FOR TENDER/ POUR APPEL-D'OFFRE	2023-12-12
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revision		date

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**RÉFECTION DE TOITURE
ROOF REPLACEMENT, CEF
BUILDING 74 / BÂTIMENT 74**

drawing title
titre du dessin
**DETAILS
DÉTAILS**

drawn by
dessiné par
ROEL PARKER

designed by
conçu par
MICHEL PAULIN

approved by
approuvé par
M.P.

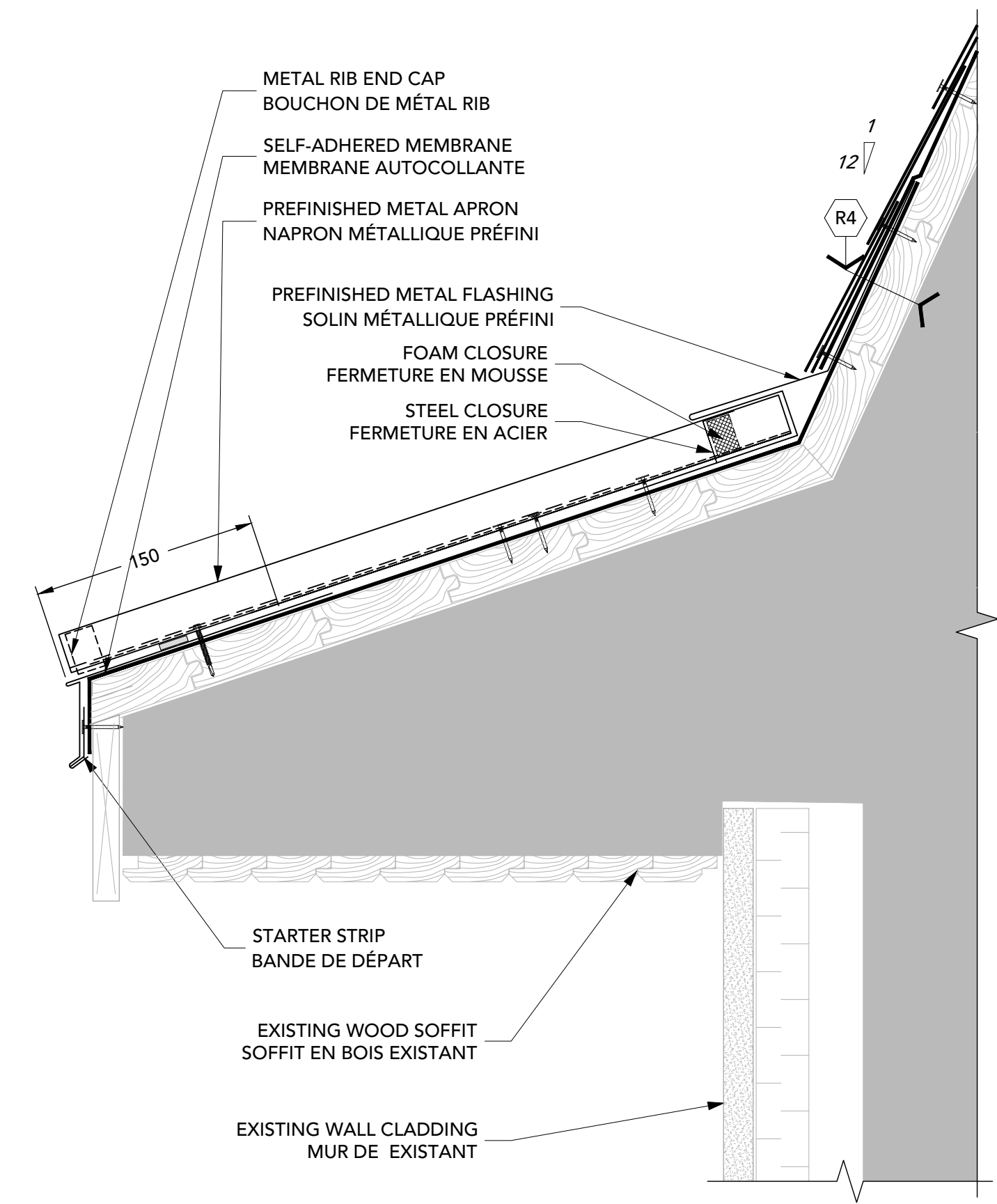
tender
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project manager
administrateur
de projets

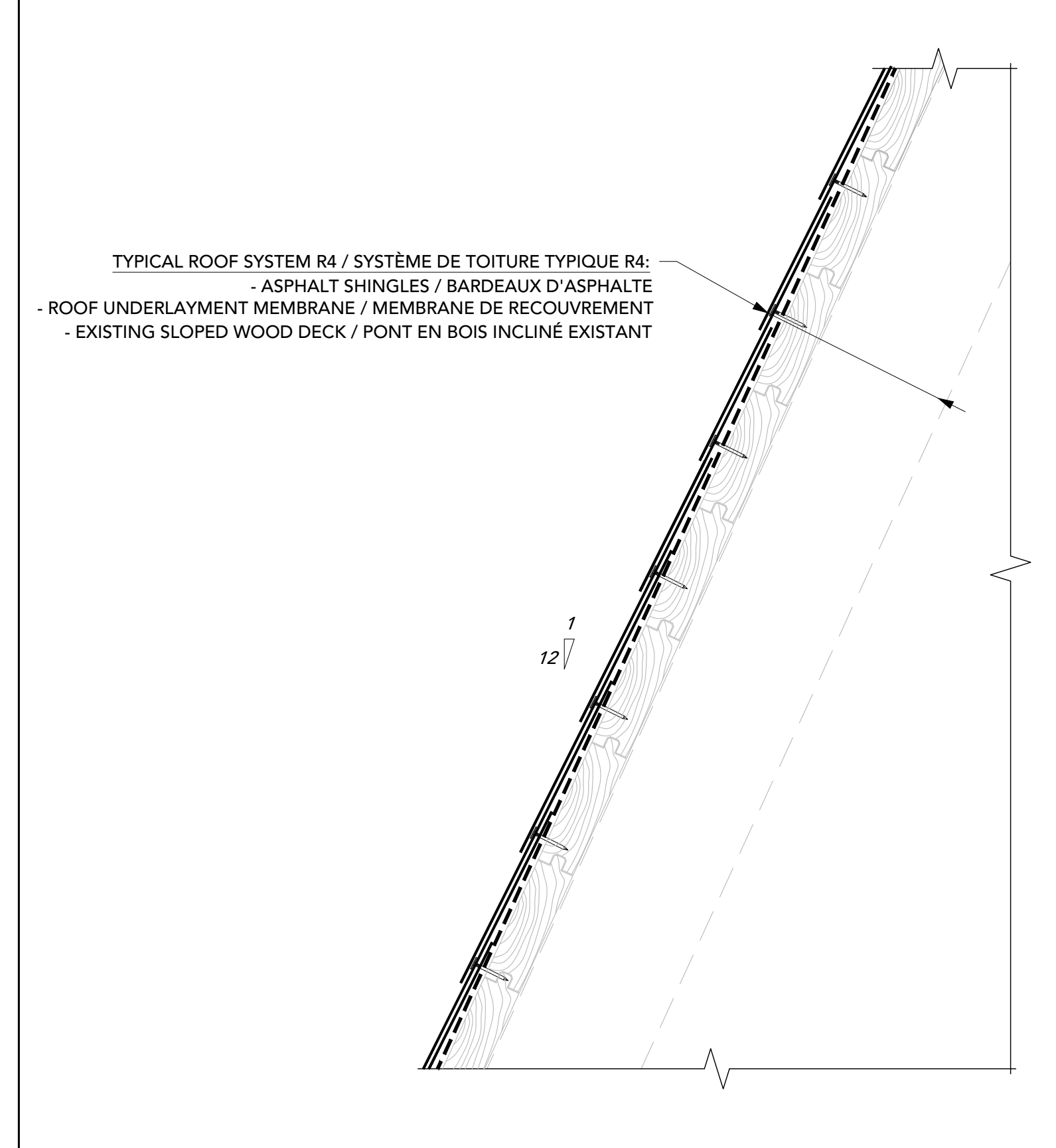
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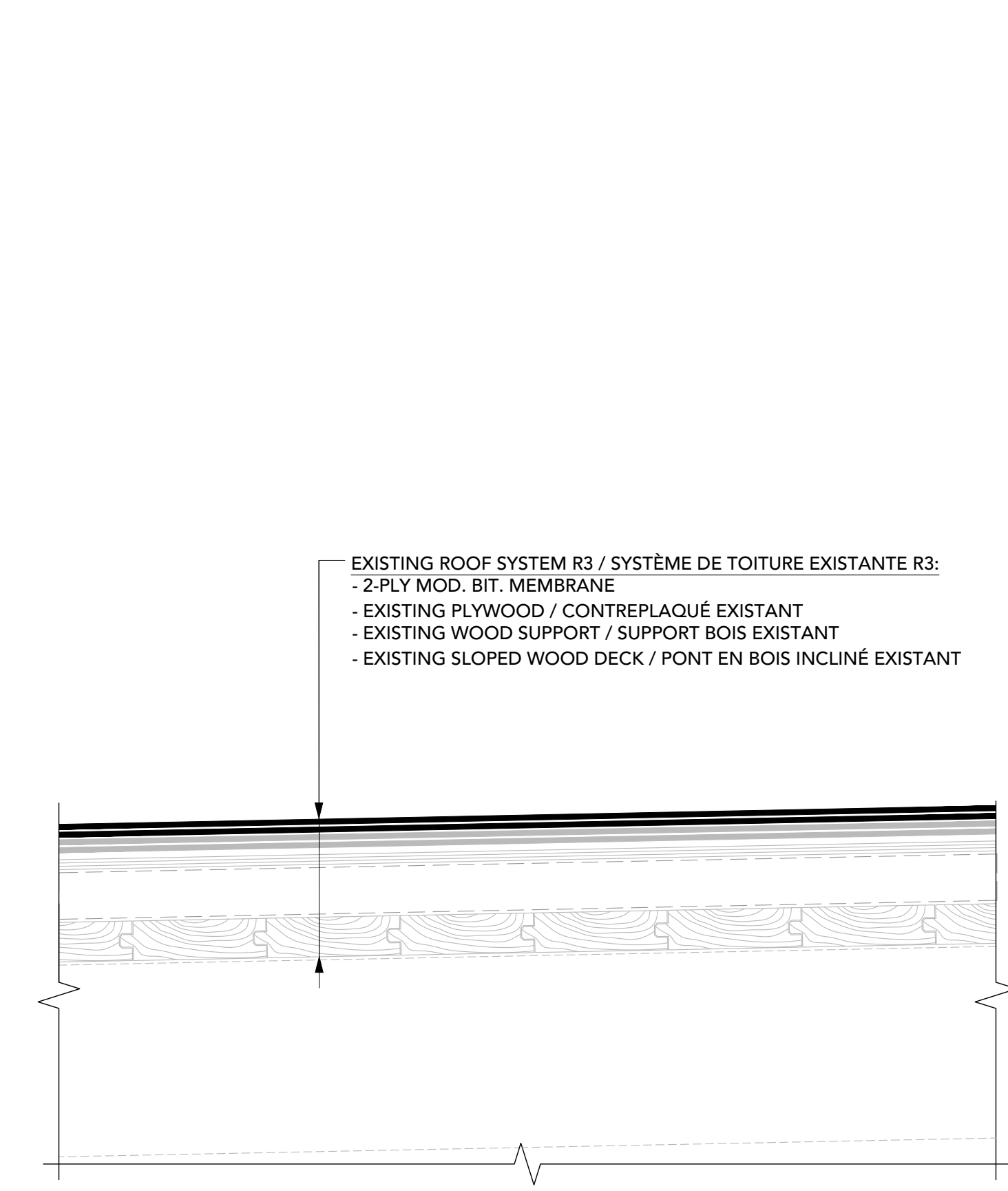
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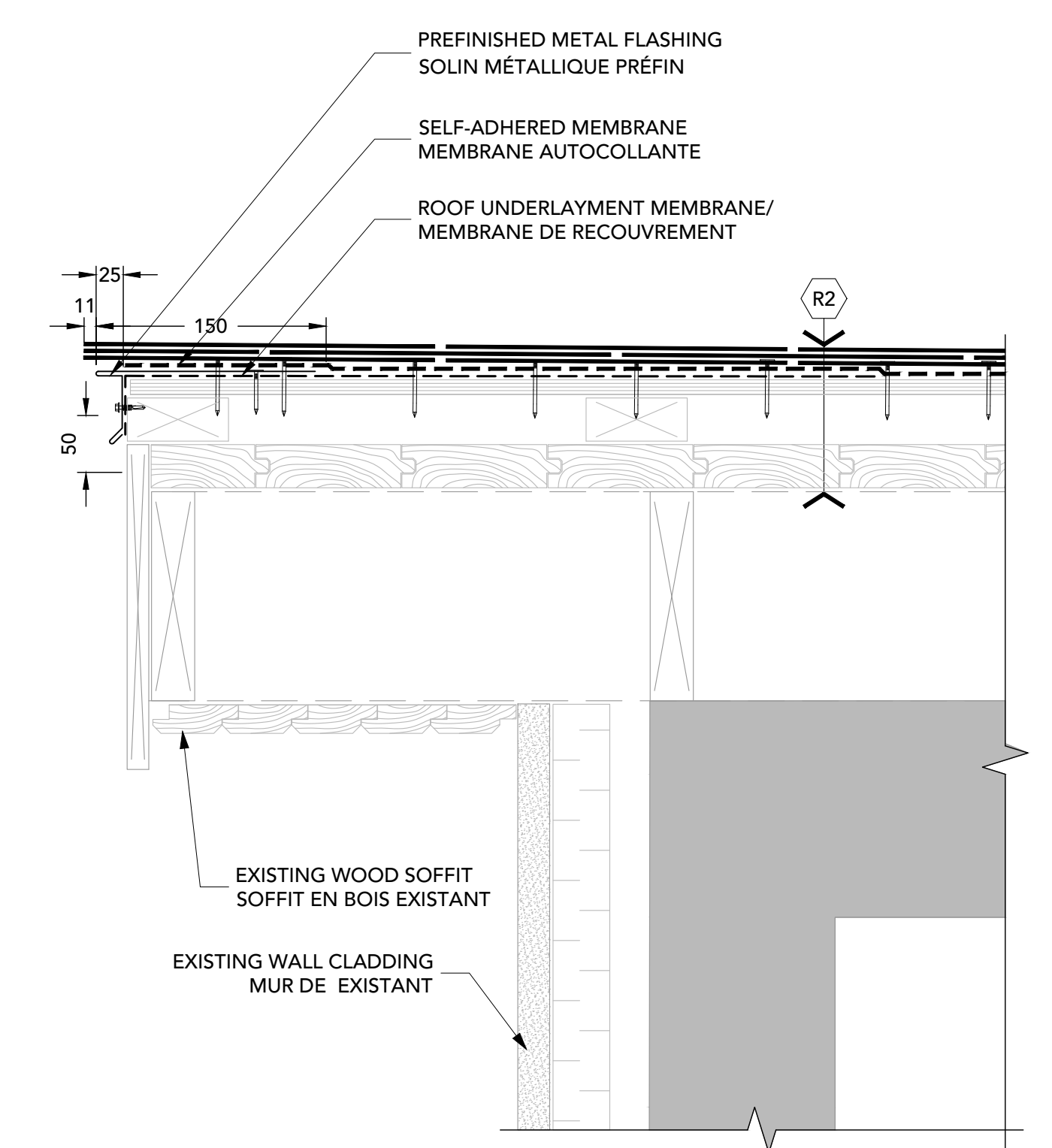
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A3 1:5



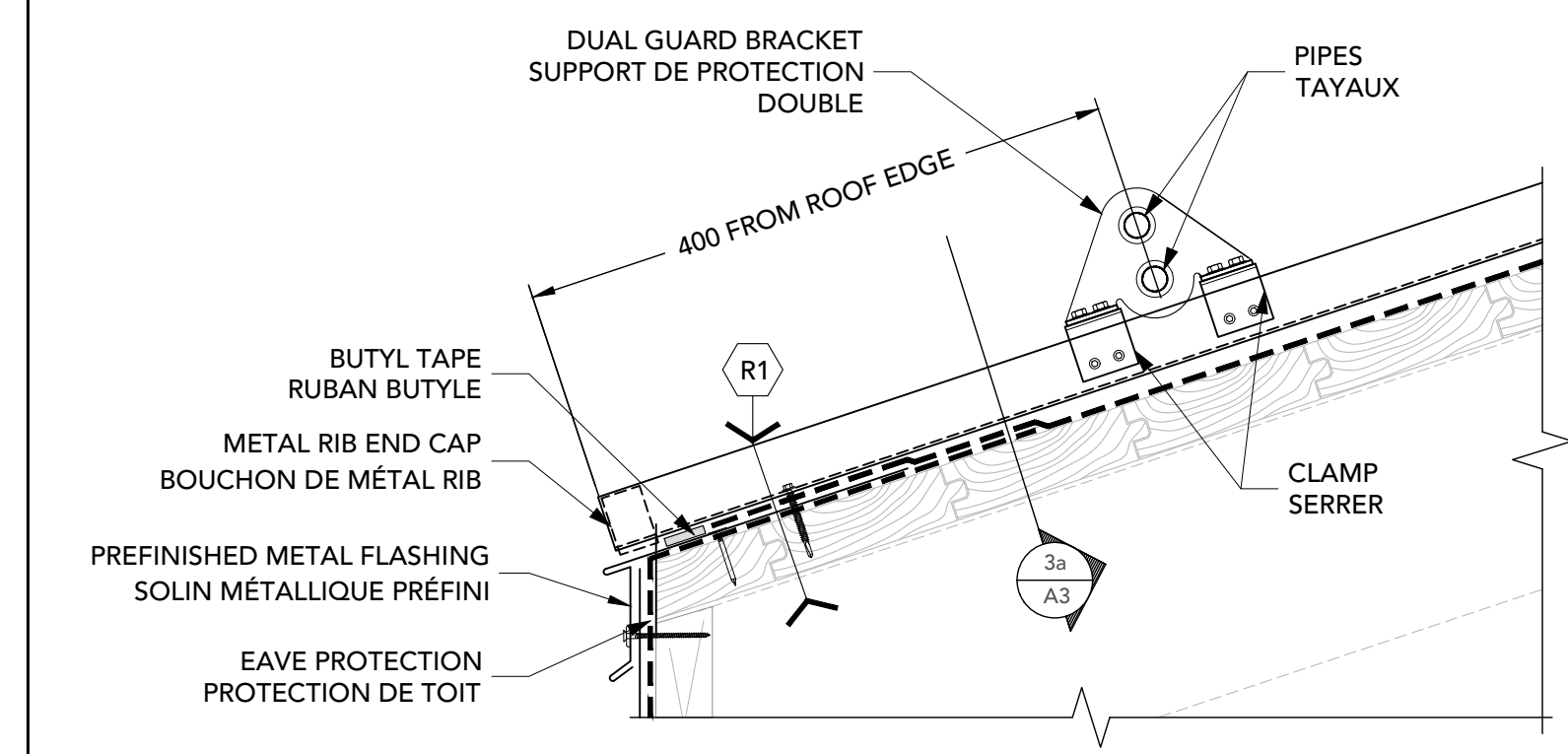
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A3 1:5 ROOF AREA 74-102 / BASSIN 74-102



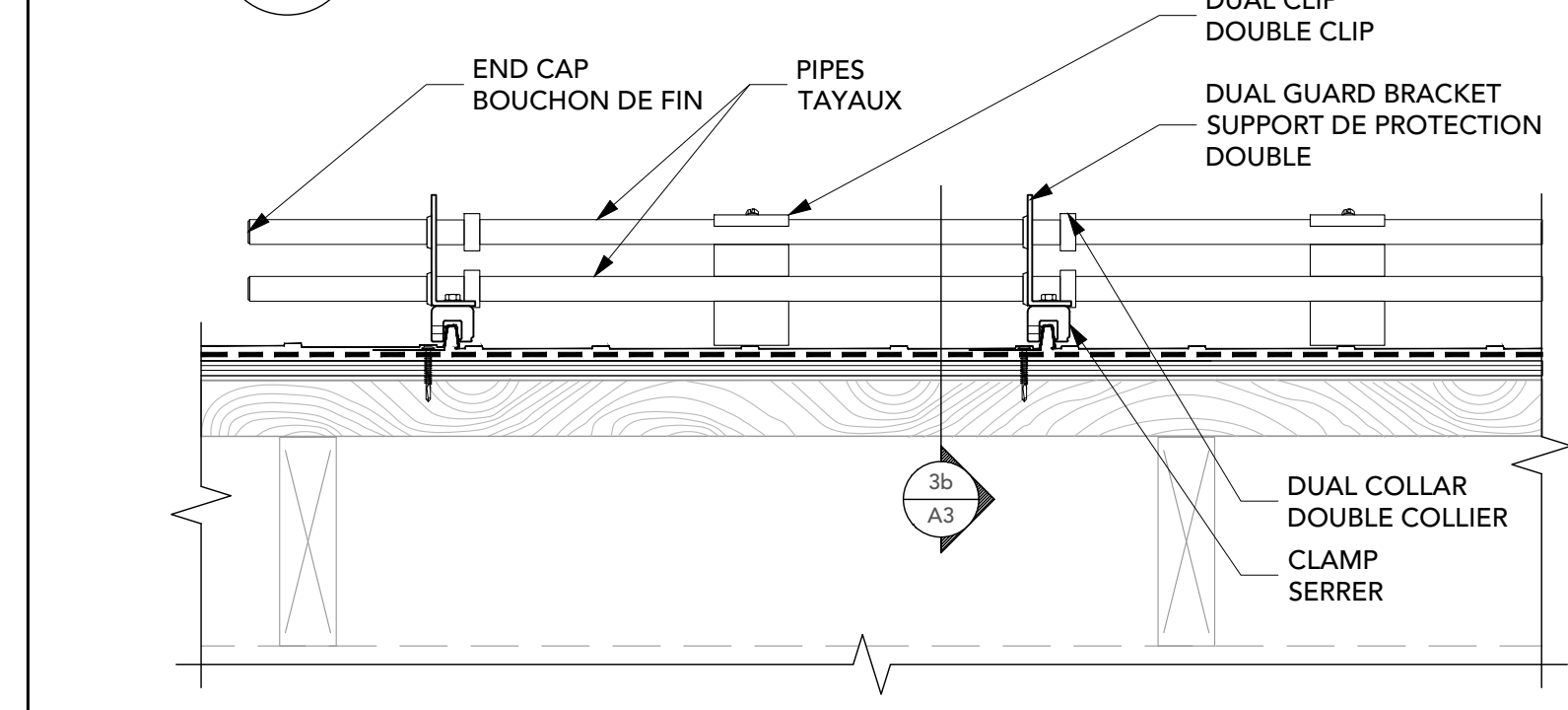
R3 TYPICAL ROOF SYSTEM R1 / SYSTÈME DE TOITURE TYPIQUE R2
A3 1:5 ROOF AREA 74-201 / BASSIN 74-201



4 ROOF EDGE / BORD DE TOIT
A3 1:5

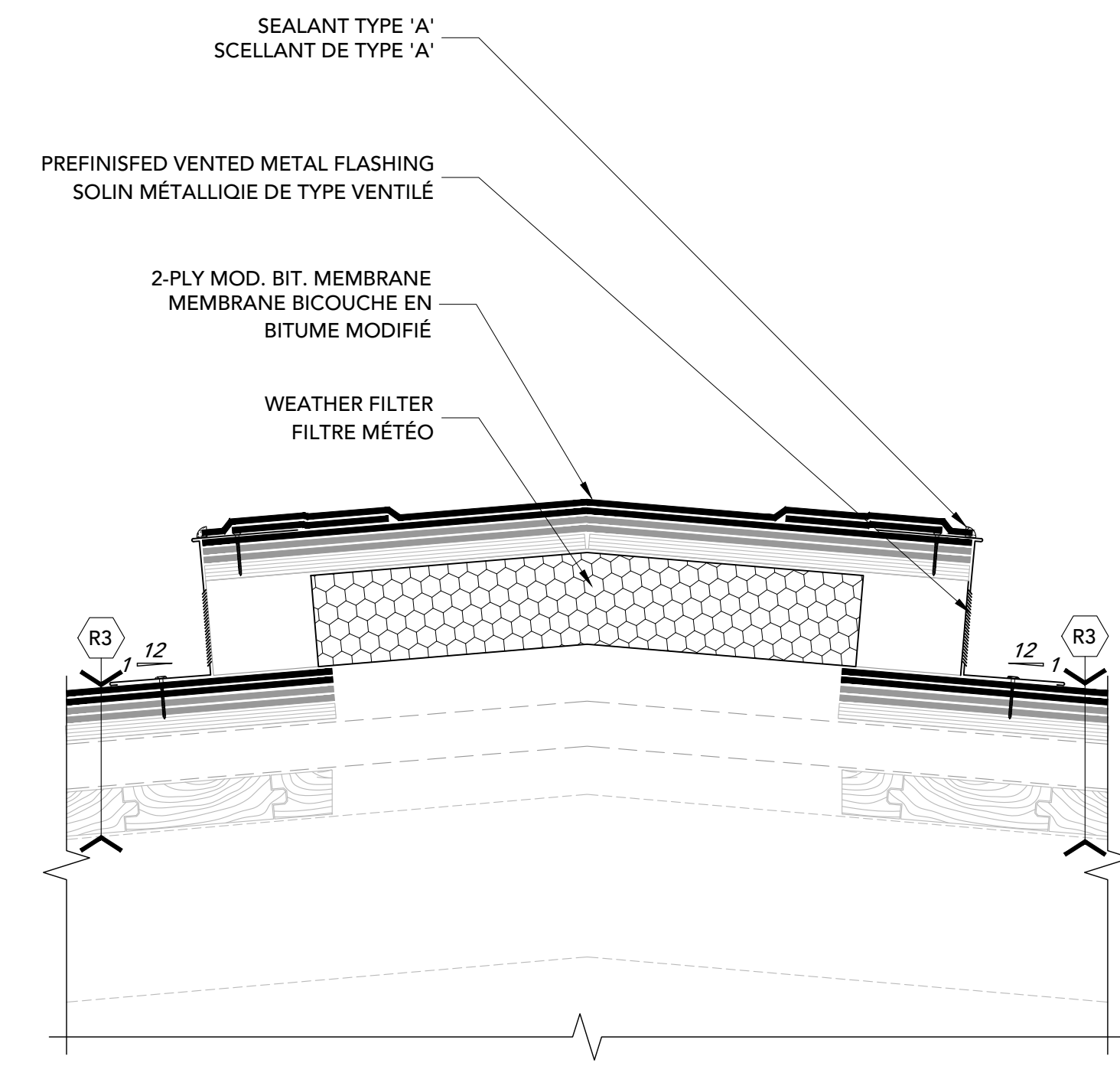


3b SECTION
A3 1:5



3a ELEVATION / ÉLÉVATION
A3 1:5

3 ICE GUARD / GARDE DE GLACE
A3 1:5



2 RIDGE VENT / D'ÉVENT FAÏTIER
A3 1:5

revision	description	date
03	FOR TENDER/ POUR APPEL-D'OFFRE	2023-12-12
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titre du projet
**RÉFECTION DE TOITURE
ROOF REPLACEMENT, CEF
BUILDING 74 / BÂTIMENT 74**

drawing title
titre du dessin
**DETAILS
DÉTAILS**

drawn by
dessiné par
ROEL PARKER

designed by
conçu par
MICHEL PAULIN

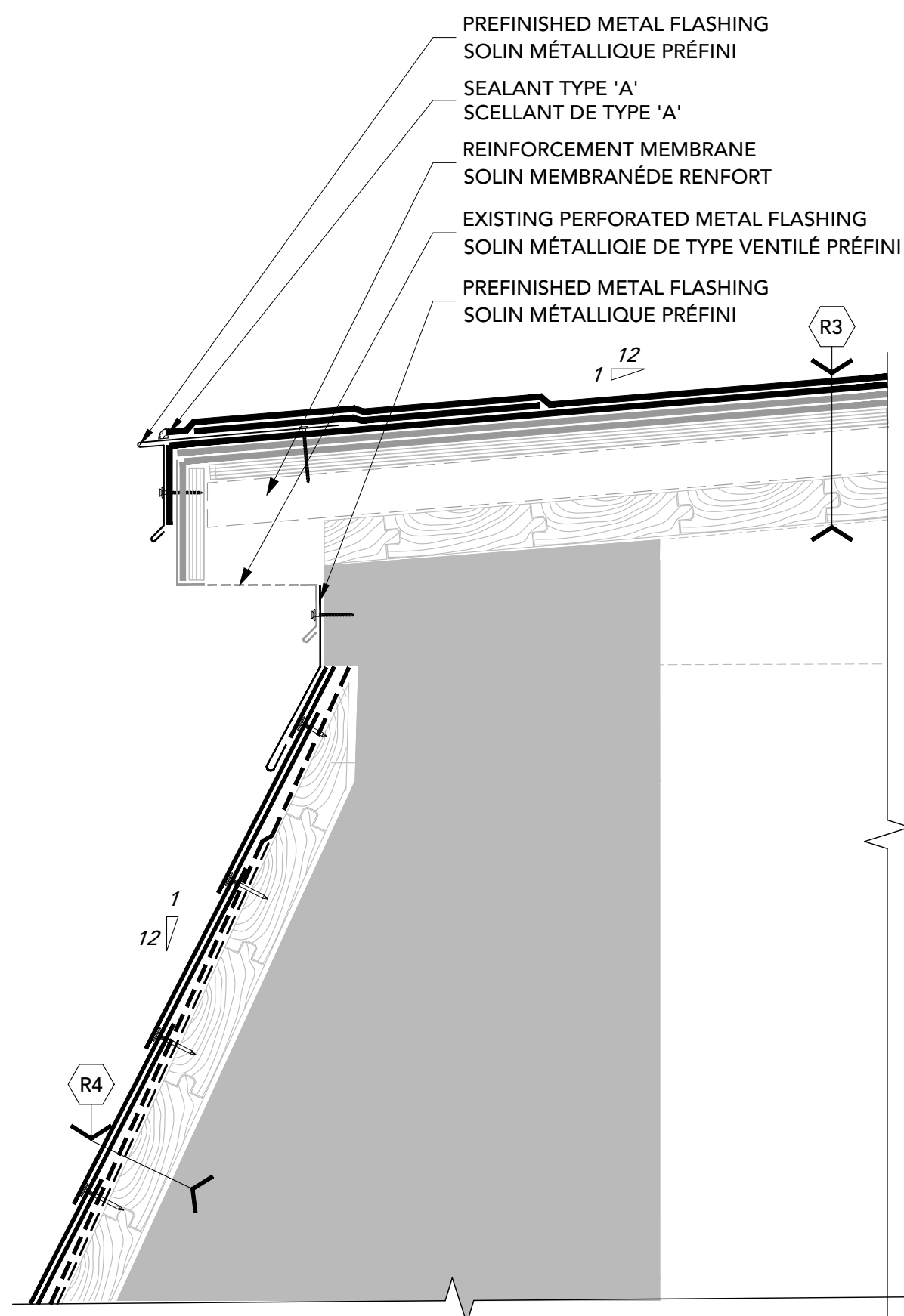
approved by
approuvé par
M.P.

tender
soumission - project manager
administrateur de projets

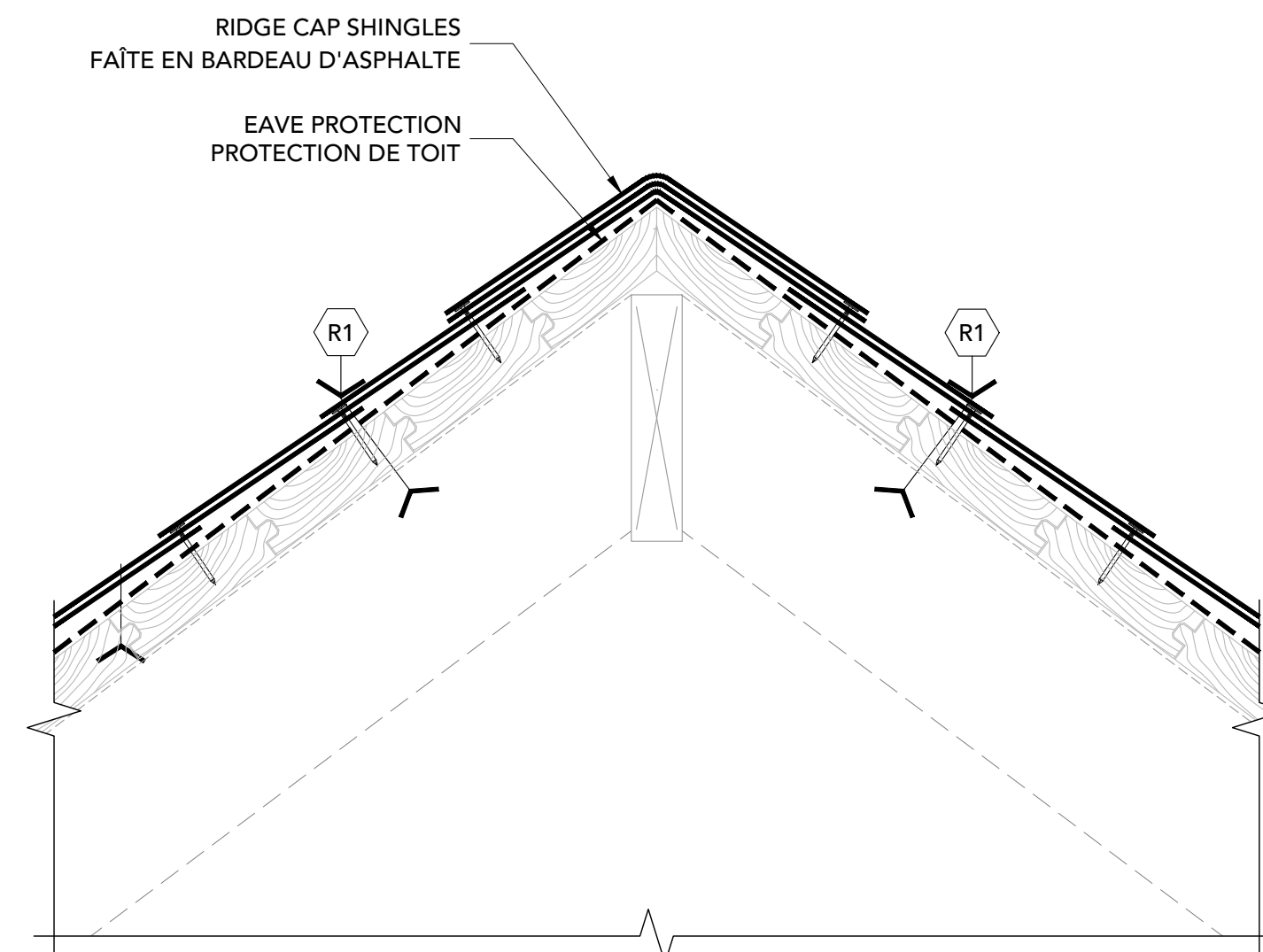
project date
date du projet
2024

project no.
no. du projet
CEF20 0008

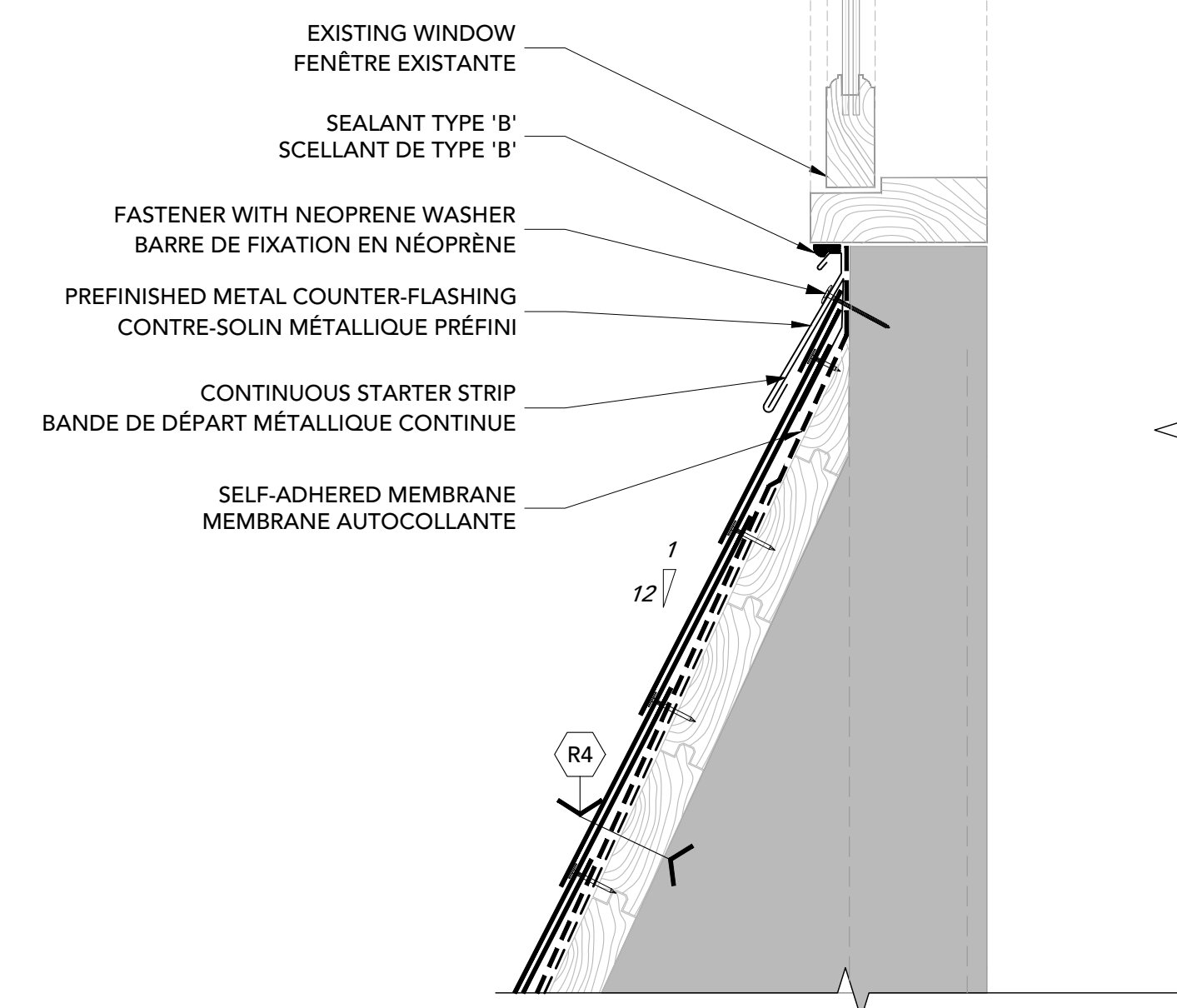
drawing no.
dessiné no.
A4



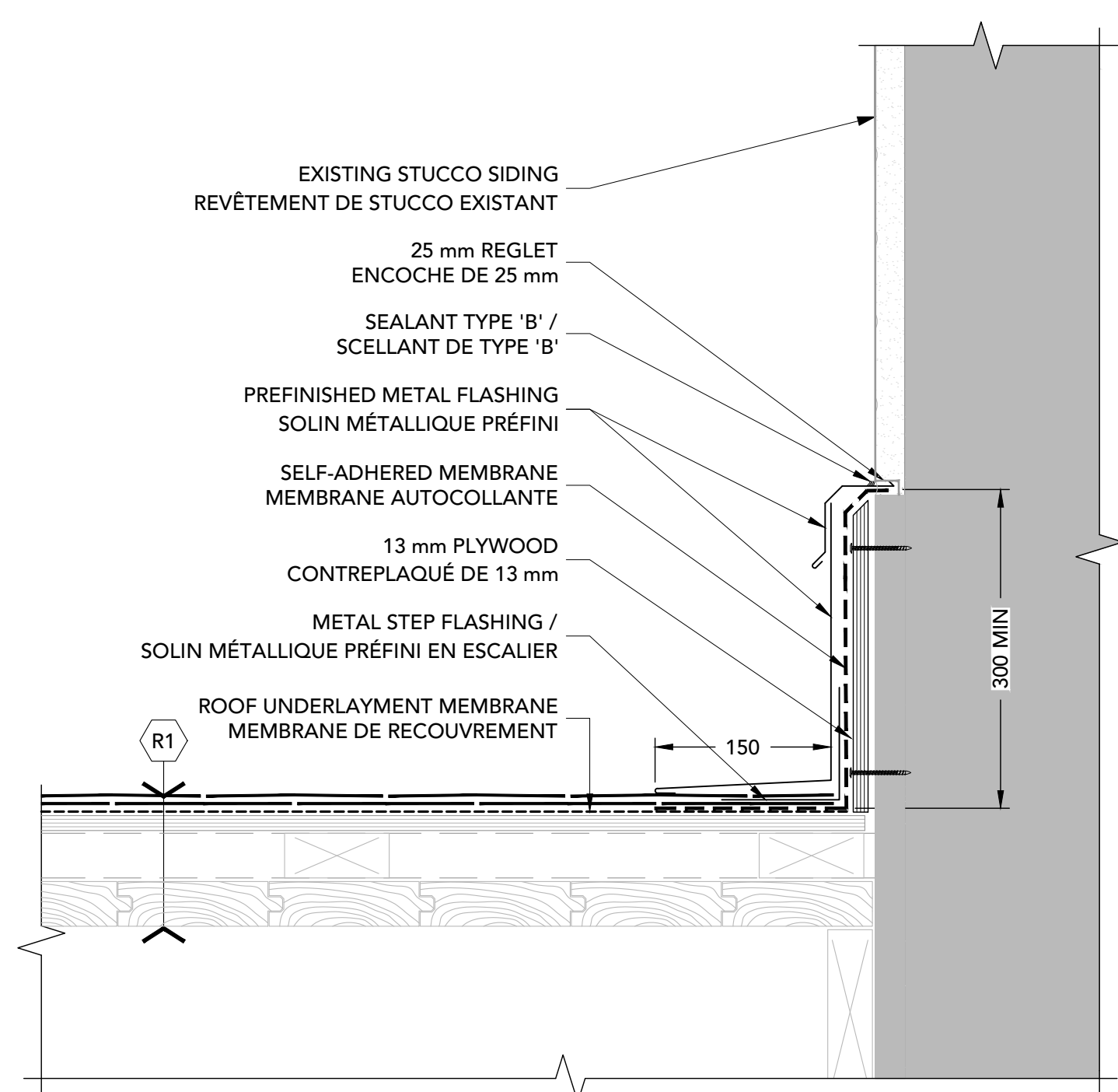
5 ROOF EAVES / AVANT TOIT
A4 1:5



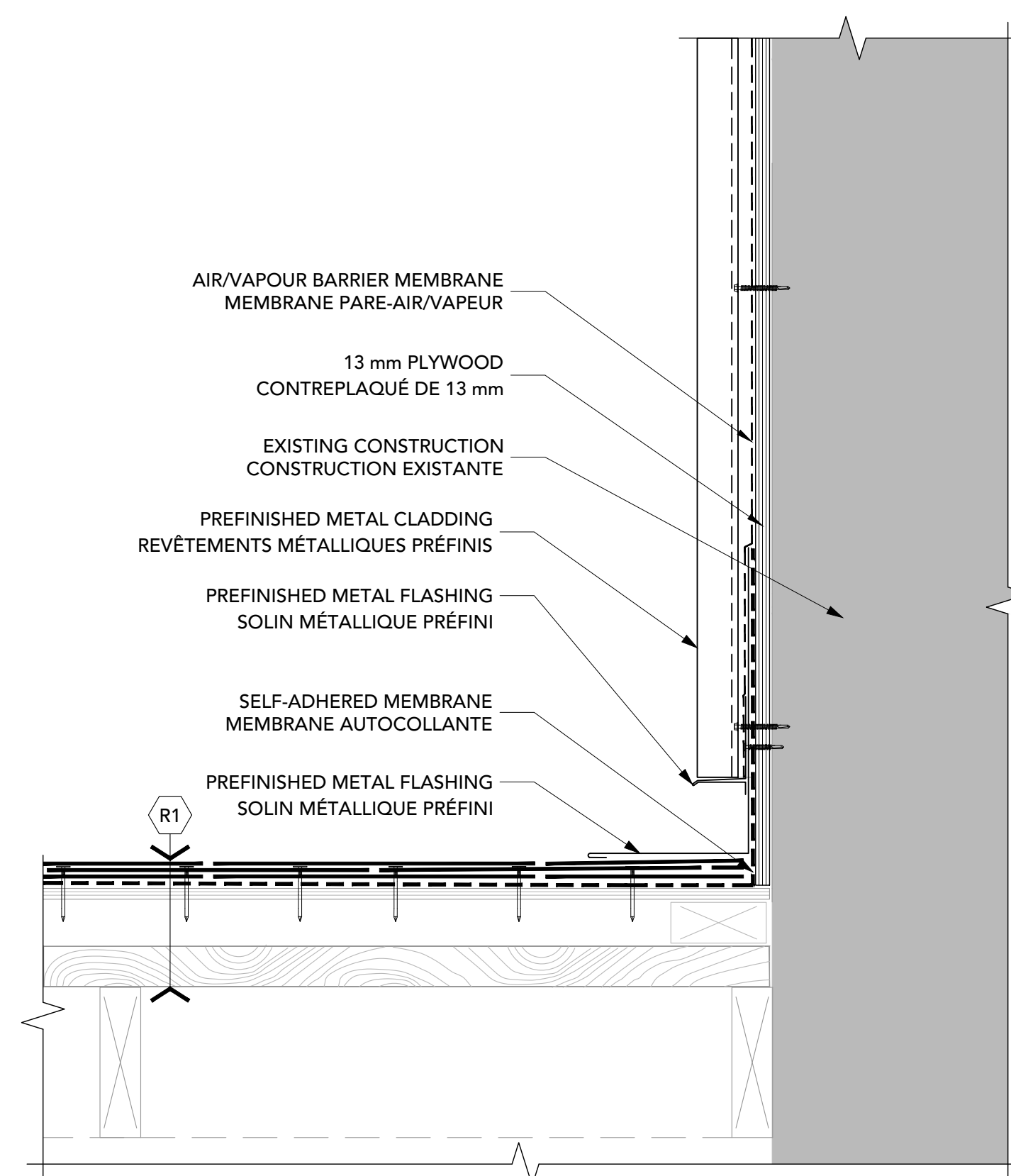
6 ROOF RIDGE / CRÊTE DE TOIT
A4 1:5



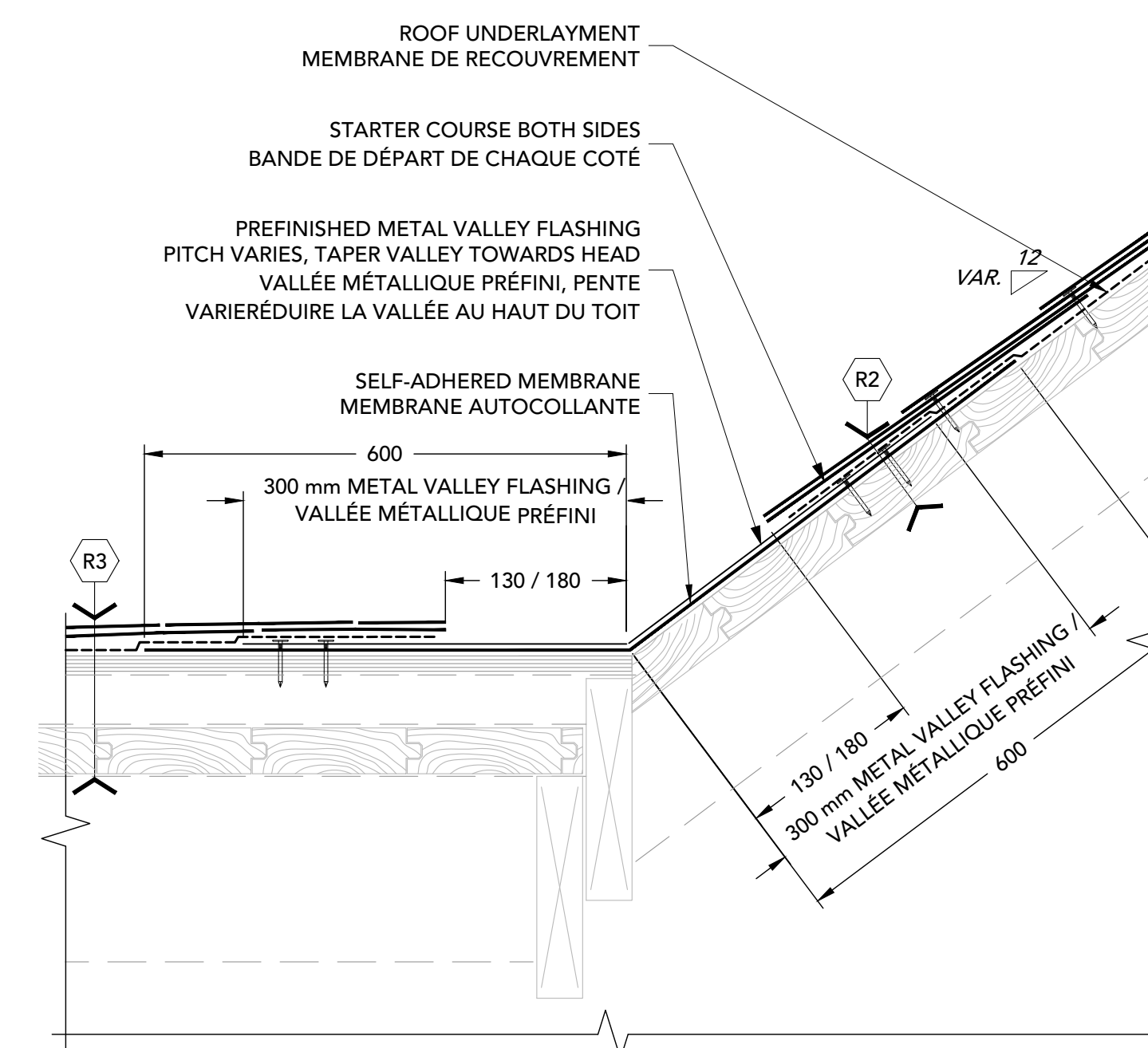
7 WINDOW FLASHING / SOLIN FENÊTRE
A4 1:5



8 WALL FLASHING / SOLIN MURAL
A4 1:5



9 WALL FLASHING / SOLIN MURAL
A4 1:5



10 VALLEY / VALLÉE
A4 1:5

revision	description	date
03	FOR TENDER/ POUR APPEL-D'OFFRE	2023-12-12
02	FOR 99% REVIEW/ POUR RÉVISION DE 99%	2020-08-28
01	FOR 66% REVIEW/ POUR RÉVISION DE 66%	2020-08-21

Do not scale drawings.
Verify all dimensions and conditions on site and
immediately notify the engineer of all discrepancies.

Detail No. No. du détail	drawing no. - where detail required dessin no. - où détail exigé	drawing no. - where detailed dessin no. - où détaillé
A		
B		
C		

project title
titre du projet
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ROOF REPLACEMENT, CEF
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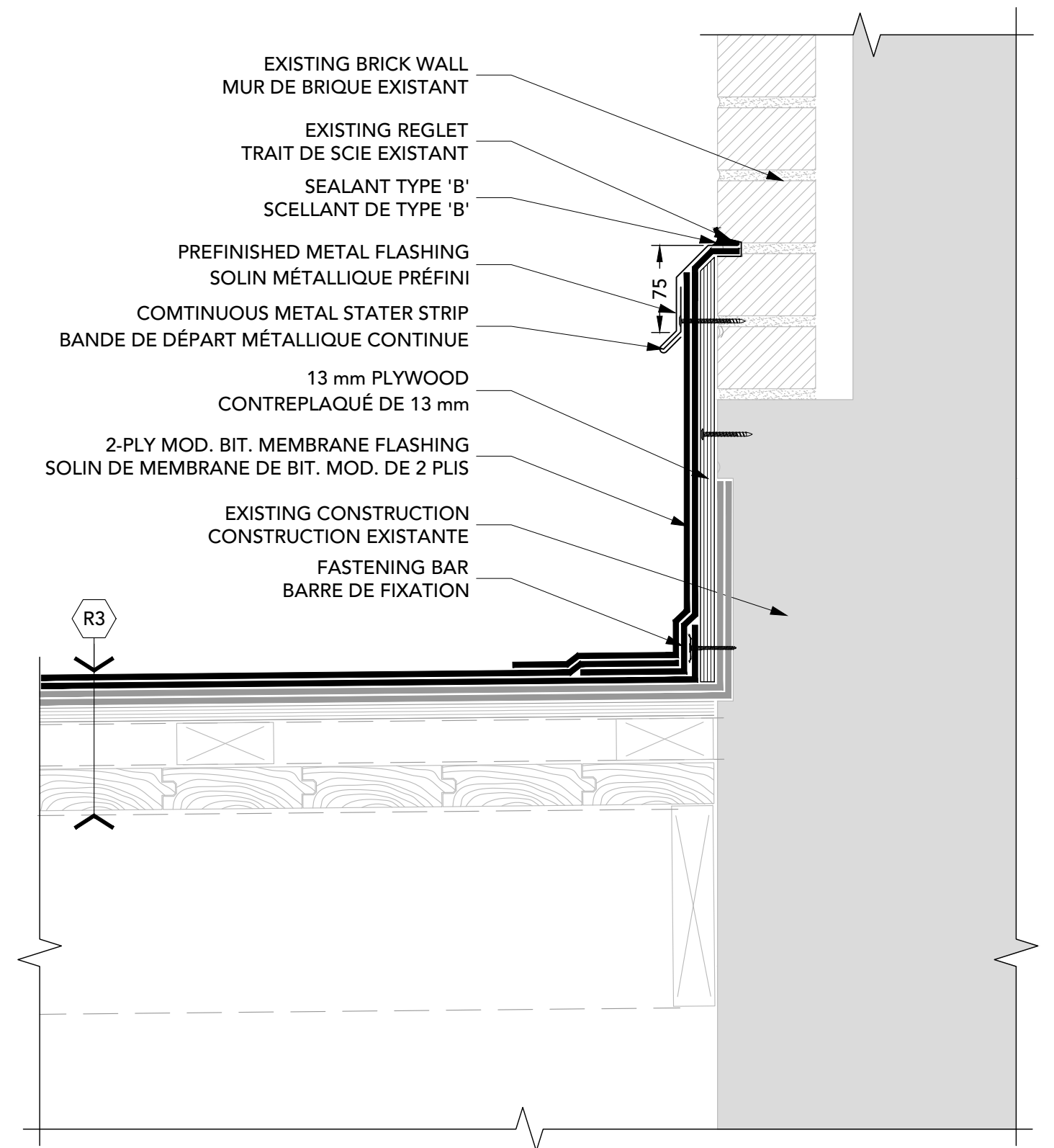
tender
soumission
-

project manager
administrateur
de projets

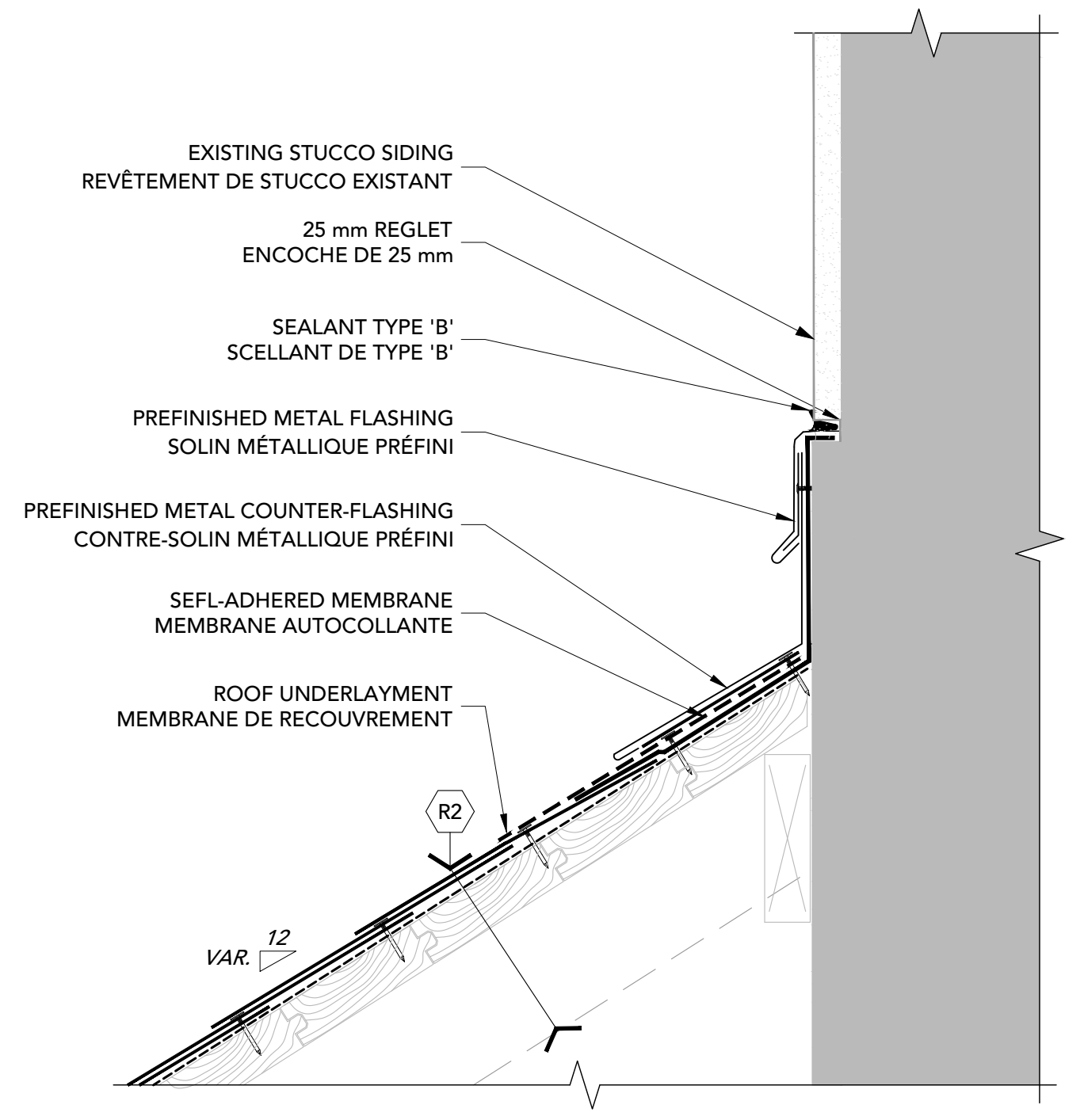
project date
date du projet
2024

project no.
no. du projet
CEF20 0008

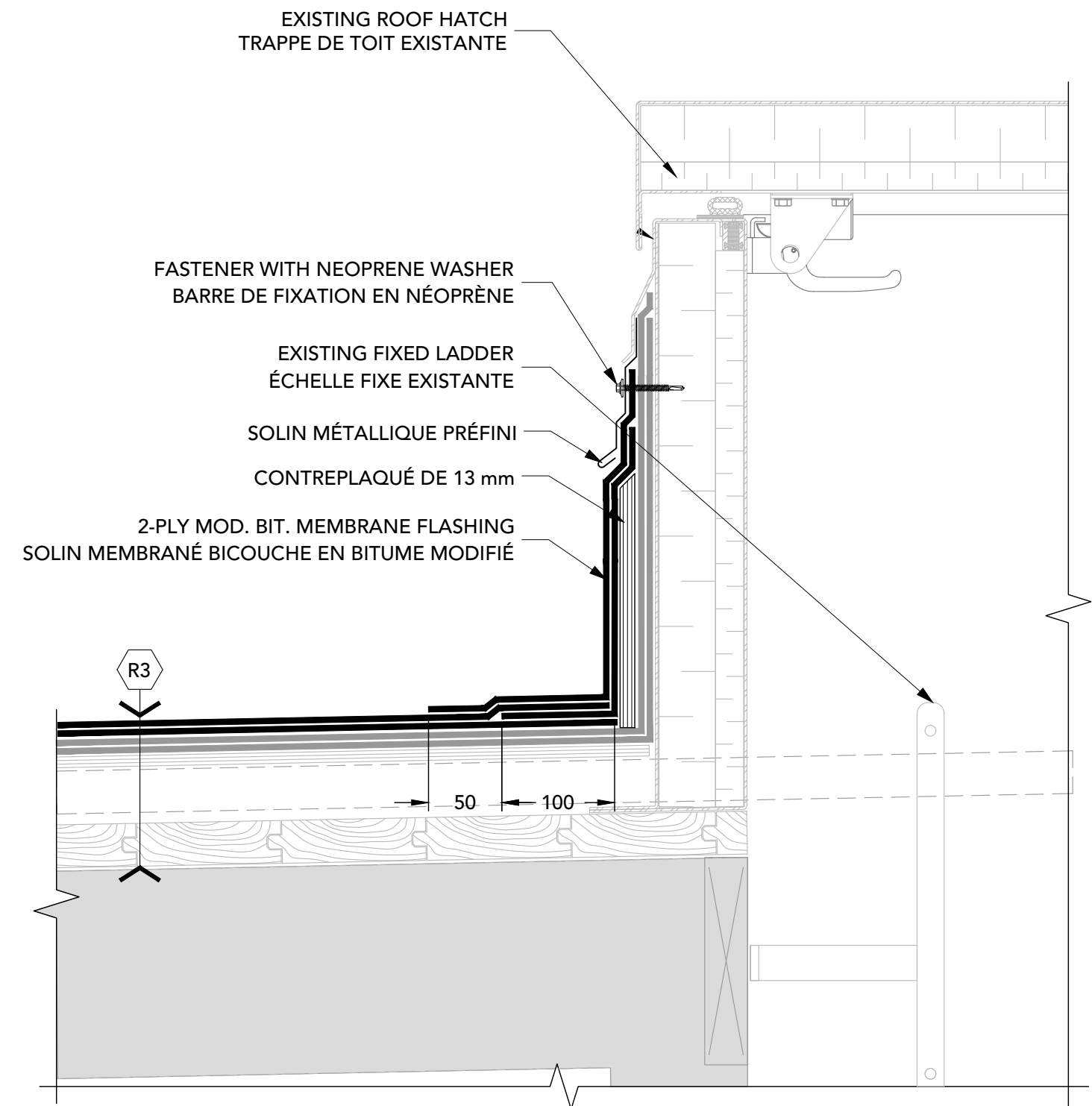
drawing no.
dessiné no.
A5



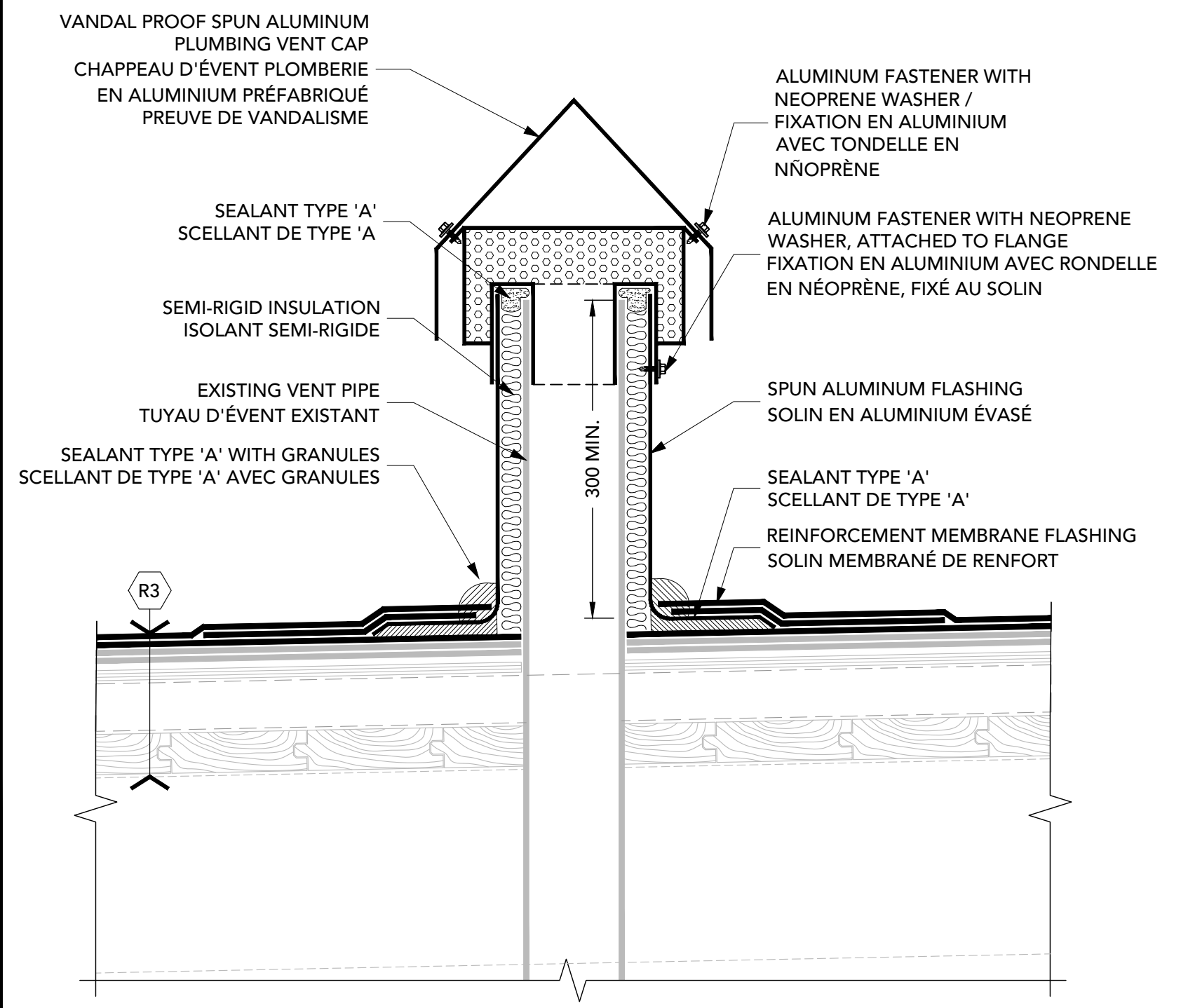
11 WALL FLASHING/SOLIN MURAL
A5 1:5



12 WALL FLASHING / SOLIN MURAL
A5 1:5



13 ROOF HATCH / ÉCOUTILLE DE TOIT
A5 1:5



14 PLUMBING VENT/ÉVENT DE PLOMBERIE
A5 1:5

RESERVED / RÉSERVÉ

RESERVED / RÉSERVÉ

BID AND ACCEPTANCE FORM (BA)

BA01 IDENTIFICATION

Roof Replacement – Building 74 - Central Experimental Farm Ottawa

BA02 LEGAL NAME AND ADDRESS OF BIDDER

Legal Name:					
Operating Name (if any):					
Address:					
Telephone:		Fax:		PBN:	
E-mail address:					
Contract Security Program Organisation Number (when required)					

BA03 THE OFFER

The Bidder offers to Canada to perform and complete the Work for the above named project in accordance with the Bid Documents for the Total Bid Amount of

\$ _____ excluding Applicable Taxe(s).
(amount in numbers)

BA04 BID VALIDITY PERIOD

The bid must not be withdrawn for a period of 60 days following the date of solicitation closing.

BA05 ACCEPTANCE AND CONTRACT

Upon acceptance of the Bidder's offer by Canada, a binding Contract will be formed between Canada and the Bidder. The documents forming the Contract will be the Contract Documents identified in "Contract Documents (CD)" section.

BA06 CONSTRUCTION TIME

The Contractor must perform and complete the Work by March 31, 2024.

BA07 BID SECURITY

The Bidder must enclose bid security with its bid in accordance with G108 - Bid Security Requirements of R2710T - General Instructions - Construction Services - Bid Security Requirements.

BA08 SIGNATURE

--

Name and title of person authorized to sign on behalf of Bidder (Type or print)

--

Signature

--

Date

APPENDIX 2 - LISTING OF SUBCONTRACTORS AND SUPPLIERS

The Bidder must submit the list of Subcontractors and Suppliers for any division of the Work as listed in the table below. If "own forces" of the General Contractor are planned to be used to execute certain division(s) of work it must also be indicated in the table below.

	Subcontractor and Suppliers	Division
1		
2		
3		
4		

ANNEX A - CERTIFICATE OF INSURANCE
(Not required at solicitation closing)

CERTIFICATE OF INSURANCE



Travaux publics et
Services gouvernementaux
Canada

Public Works and
Government Services
Canada

Description and Location of Work	Contract No.
	Project No.

Name of Insurer, Broker or Agent	Address (No., Street)	City	Province	Postal Code
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Name of Insured (Contractor)	Address (No., Street)	City	Province	Postal Code
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Additional Insured
His Majesty the King in right of Canada as represented by the Minister of Public Works and Government Services

Type of Insurance	Insurer Name and Policy Number	Inception Date D / M / Y	Expiry Date D / M / Y	Limits of Liability		
				Per Occurrence	Annual General Aggregate	Completed Operations Aggregate
Commercial General Liability Umbrella/Excess Liability				\$	\$	\$
Builder's Risk / Installation Floater				\$		
Pollution Liability				\$ <input type="checkbox"/> Per Incident <input type="checkbox"/> Per Occurrence		Aggregate \$
Marine Liability				\$		
Aviation Liability				\$ <input type="checkbox"/> Per Incident <input type="checkbox"/> Per Occurrence		Aggregate \$
Insert other type of insurance as required				\$		

I certify that the above policies were issued by insurers in the course of their Insurance business in Canada, are currently in force and include the applicable insurance coverage's stated on page 2 of this Certificate of Insurance, including advance notice of cancellation / reduction in coverage.

Name of person authorized to sign on behalf of Insurer(s) (Officer, Agent, Broker)

Telephone number

Signature

Date D / M / Y

File No. - N° du dossier
23-207

General

The insurance policies required on page 1 of the Certificate of Insurance must be in force and must include the insurance coverage listed under the corresponding type of insurance on this page.

The policies must insure the Contractor and must include His Majesty the King in right of Canada as represented by the Minister of Public Works and Government Services as an additional Insured.

The Policy shall be endorsed to provide the Owner with not less than 30 days' notice in writing in advance of any cancellation or change or amendment restricting coverage.

Without increasing the limit of liability, the policies must protect all insured parties to the full extent of coverage provided. Further, the policies must apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each.

Commercial General Liability

The insurance coverage provided must not be substantially less than that provided by the latest edition of IBC Form 2100.

The policy must either include or be endorsed to include coverage for the following exposures or hazards if the Work is subject thereto:

- (a) Blasting.
- (b) Pile driving and caisson work.
- (c) Underpinning.
- (d) Removal or weakening of support of any structure or land whether such support be natural or otherwise if the work is performed by the insured contractor.
- (e) Damage to existing structure

The policy must have the following minimum limits:

- (a) **\$5,000,000** Each Occurrence Limit;
- (b) **\$10,000,000** General Aggregate Limit per policy year if the policy contains a General Aggregate; and
- (c) **\$5,000,000** Products/Completed Operations Aggregate Limit.

Umbrella or excess liability insurance may be used to achieve the required limits.