NRC·CNRC Administrative Services and Property Management

SPECIFICATIONS

SOLICITATION #: 18-22122

BUILDING: M-58
1200 Montreal Road
Ottawa, Ontario

PROJECT: M58- Roof Replacement Area 1, 5 and 8

PROJECT #: M58-5398

Date: March 2019

SPECIFICATION

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NRC·CNRC

From **Discovery** to **Innovation...**

Directions to the Ottawa Research Facilities — Montreal Road

1200 Montréal Road
Ottawa, Ontario, Canada K1A 0R6

Tel: 613-993-9101

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Information/Security	M-1
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By Road, from the OTTAWA International Airport

1. From the airport take the AIRPORT PARKWAY to RIVERSIDE DR EAST
2. Follow RIVERSIDE DR EAST to HIGHWAY 417 EAST
3. Take HIGHWAY 417 EAST, past the ST-LAURENT BLVD exit, where HIGHWAY 417 splits, continue LEFT on HIGHWAY 174 (ROCKLAND)
4. Exit HIGHWAY 174 on BLAIR RD NORTH
5. Proceed on BLAIR RD NORTH, cross OGILVIE RD, and continue on to the traffic lights at the intersection of BLAIR and MONTREAL RD
6. Turn left onto MONTREAL RD and take the first immediate right onto the ramp leading down to the traffic circle. Stop at Building M-1 on the north side of the traffic circle. Ask the commissionaires in M-1 for directions to the NRC building, institute or staff member you seek.

By Road, from MONTRÉAL

1. Take MÉTROPOLITAIN 40 WEST and follow signs for OTTAWA and HIGHWAY 417 WEST
2. Follow 417 WEST to reach OTTAWA
3. Exit at HIGHWAY 174 EAST (ROCKLAND) when entering OTTAWA
4. Follow 174 EAST and exit at BLAIR RD NORTH (first exit after entering 174 EAST)
5. Follow BLAIR RD NORTH, cross OGILVIE RD, and continue on to the traffic lights at the intersection of BLAIR and MONTREAL RD
6. Turn left onto MONTREAL RD and take the first immediate right onto the ramp leading down to the traffic circle. Stop at Building M-1 on the north side of the traffic circle. Ask the commissionaires in M-1 for directions to the NRC building, institute or staff member you seek.


1 Sussex Facilities
2 Montreal Road Facilities
3 Uplands Facilities
4 NRC-CSTT
N
GATINEAU
OTTAWA
QUÉBEC
ONTARIO
Outaouais
Aylmer
Taché
Rockcliffe
Montréal
Aviation
Blair
Vanier
Sussex
Wellington
Bank
Island Park
Ottawa River
Carling
Fisher
Prince of Wales
Bronson
Walkley
Heron
Hawthorne
Hunt Club
Baseline
Riverside
Conroy
Airport
Uplands
Lester
Davidson
Albion
Hunt Club (W)
Merivale
Woodroffe
Greenbank
Fallowfield
Leitrim
50
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148
34
174
417
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38
31
73
416
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NRC Institute
Trans Canada HWY
Major HWY
Secondary HWY
Airport
Train Station
Ferry
Bus Station
Metro


N
Howlett
Blair
Leggett
2
Montréal
17B
Montréal
Macallum
Mackenzie
Lathe
Ballard
17B
Blair
Aviation
Bathgate
St. Laurent
Ogilvie
174
417
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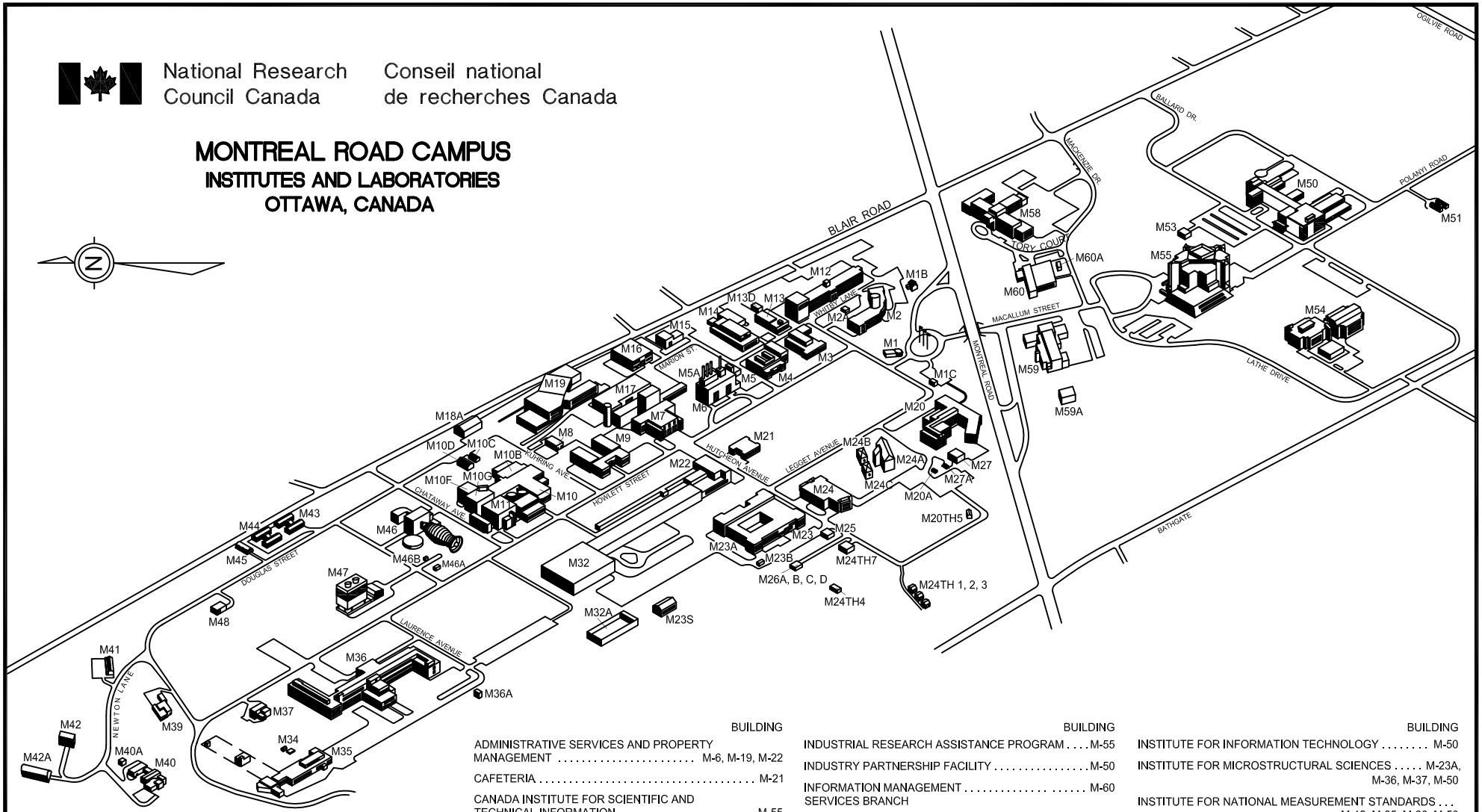
NRC Institute
Major HWY
Airport
Ferry
Metro
Trans Canada HWY
Secondary HWY
Train Station
Bus Station

National Research Council Canada | Conseil national de recherches Canada

MONTREAL ROAD CAMPUS
INSTITUTES AND LABORATORIES
OTTAWA, CANADA



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Updated: July 2008

National Research Council Canada	Conseil national de recherches Canada
Administrative Services & Property management Branch (ASPM)	Direction des services administratif et gestion de l'immobilier (SAGI)

Construction Tender Form

Project Identification **M58 Roof Replacement areas 1, 5 and 8**

Tender No.: **18-22122**

1.2 **Business Name and Address of Tenderer**

Name_____

Address_____

_____

Contact Person(Print Name)_____

Telephone (_____) _____ **Fax**: (_____) _____

1.3 Offer

I/We the Tenderer, hereby offer to Her Majesty the Queen in Right of Canada (hereinafter referred to as "Her Majesty") represented by the National Research Council Canada to perform and complete the work for the above named project in accordance with the Plans and Specifications and other Tender Documents, at the place and in the manner set out therein for the Total Tender Amount (to be expressed in numbers only) of**: $_____. _____ in lawful money of Canada (excluding GST/HST)**

The above amount is inclusive of all applicable (*) Federal, Provincial and Municipal taxes except that in the event of a change in any tax imposed under the Excise Act, the Excise Tax Act, the Old Age Security Act, the Customs Act, the Customs Tariff or any provincial sales tax legislation imposing a retail sales tax on the purchase of tangible personal property incorporated into Real Property, that occurs

.1 after the date this tender was mailed or delivered, or
.2 if this tender is revised, after the date of the last revision

the amount of this offer shall be decreased or decreased in the manner provided for in GC22 of the General Conditions of the Contract Documents.

1.3.1 Offer (continued)

(*) For the purpose of this tender, the Goods and Services Tax (GST) is not to be considered as an applicable tax.

In the province of Quebec, the Quebec Sales Tax is not to be included in the tender amount because the Federal Government is exempt from this tax. Tenderers shall make arrangements directly with the provincial Revenue Department to recover any tax they may pay on good and servives acquired in the performance of this contract. However, tenderers should include in their tender amount Quebec Sales Tax for which an Input Tax Refund is not available.

1.4 Acceptance and Entry into Contract

I/We undertake, within fourteen (14) days of notification of acceptance of my/our offer, to sign a contract for the performance of the work provided I/we are notified, by the Department, of the acceptance of my/our offer within 30 days of the tender closing date.

1.5 Construction Time

I/We Agree to complete the work within the time stipulated in the specification from the date of notification of acceptance of my/our offer.

1.6 Bid Security

I/We herewith enclose tender security in accordance with Article 5 of the General Instruction to Tenderers.

I/We understand that if a security deposit is furnished as tender security and if I/we refuse to enter into a contract when called upon to do so, my/our security deposit shall be forfeited but the Minister may, if it is in the public interest, waive the right of Her Majesty to forfeit the security deposit.

I/We understand that if the security furnished is not in the approved from as described in Article 5 of the General Instructions to Tenderers, my/our tender is subject to disqualification.

1.7 Contract Security

Within fourteen (14) days after receipt of written notification of the acceptance of my/our offer, I/we will furnish contract security in accordance with the Contract Conditions "F" of the Contract Documents.

I/We understand that the contract security referred to herein, if provided in the form of a bill of exchange, will be deposited into the Consolidated Revenue Fund of Canada.

1.8 Appendices

This Tender Form includes Appendix No. _____N/A_____.

1.9 Addenda

The Total Tender Amount provides for the Work described in the following Addenda:

NUMBER	DATE	NUMBER	DATE

(Tenderers shall enter numbers and dates of addenda)

1.10 List of Major Subcontractors

Indicate below the business name of each of the following subcontractors:

Roofing Contractor _____

Failure to include these names will result in your bid being disqualified.

1.11 Execution of Tender

The Tenderer shall refer to Article 2 of the General Instructions to Tenderers.

SIGNED, ATTESTED TO AND DELIVERED on the _____day of _____on behalf of

_____

(Type or print the business name of the Tenderer)

AUTHORIZED SIGNATORY (IES)

_____

(Signature of Signatory)

_____

(Print name & Title of Signatory)

_____

(Signature of Signatory)

_____

(Print name & Title of Signatory)

SEAL

Project # 5398 – Roof Replacement areas 1, 5 and 8

Appendix 1 - Additional Requirements

1.1 Contractors must ensure that all work (all disciplines included) deemed to be noisy, disruptive to the building occupants or that can cause vibration must be done outside regular business hours. The remaining portions of the work can be done during the regular business hours.

1.2 Contractors must take into consideration that all signage and health and safety features are under their own responsibility at all time to ensure the security of the building users.

1.3 Contractors must take into consideration that they can access the block 1 roof from the exterior only and all circulation and transportation of materials must be done from the exterior of the building and not from the interior with the exception of the minor interior work in room E210.

1.4 Contractors to minimize visual impact of scaffolding and hide it from Blair and Montreal roads. Scaffolding location to be reviewed with the NRC project representative.

End of Appendix 1

BUY AND SELL NOTICE

M58- Roof Replacement Area 1, 5 and 8

The National Research Council Canada, 1200 Montreal Road Ottawa, ON has a requirement for a project that includes:

The work included in this contract is to re-roof area 1, 5 and 8 of building M58 which is located on NRC's property at 1200, Montreal Road in Ottawa.

Architectural Scope of Work:

Scope includes but not limited to;
- Remove existing membrane and insulation,
- Supply and install new vapor barrier, insulation and membrane on identified roofs and associated roof components,
- Supply and install new membrane on parapets,
- fill-in exterior wall penetrations of block 1 created by the obsolete ductwork removal and reinstate PC 350 partitions.

Mechanical Scope of Work:

Scope includes but not limited to;
- Remove the identified obsolete ductwork, fans and roof top unit.

Electrical Scope of Work:

Scope includes but not limited to;
- Isolate and disconnect indentified obsolete fans and roof top unit from source.

1. GENERAL

Questions regarding any aspect of the project are to be addressed to and answered only by the Departmental Representative (or his designate) or the Contracting Authority.

Any information received other than from the Departmental Representative (or his designate) or the Contracting Authority will be disregarded when awarding the contract and during construction.

Firms intending to submit tenders on this project should obtain tender documents through the Buyandsell.gc.ca TMA services provider. Addenda, when issued, will be available from the Buyandsell.gc.ca TMA service provider. Firms that elect to base their bids on tender documents obtained from other sources do so at their own risk and will be solely responsible to inform the tender calling authority of their intention to bid. Tender packages are not available for distribution on the actual day of tender closing.

2. MANDATORY SITE VISIT

It is mandatory that the bidder attends one of the site visits at the designated date and time. At least one representative from proponents that intend to bid must attend.

The site visits will be held on March 12th and March 14th , 2019 at **1:00** . Meet Sylvain Thibodeau at Building M58, Main Entrance, 1200 Montreal Road Ottawa, ON. Bidders who, for any reason, cannot attend at the specified date and time will not be given an alternative appointment to view the site and their tenders, therefore, will be considered as non-responsive. **NO EXCEPTIONS WILL BE MADE.**

As proof of attendance, at the site visit, the Contracting Authority will have an Attendance Form which MUST be signed by the bidder's representative. It is the responsibility of all bidders to ensure they have signed the Mandatory Site Visit Attendance form prior to leaving the site. Proposals submitted by bidders who have not attended the site visit or failed to sign the Attendance Form will be deemed non-responsive.

3. CLOSING DATE

Closing date is March 29th, 2019 at 14:00.

4. TENDER RESULTS

Following the Tender closing, the tender results will be sent by facsimile to all Contractors who submitted a tender

5. SECURITY REQUIREMENT FOR CANADIAN CONTRACTORS

5.1 MANDATORY SECURITY REQUIREMENT:

This procurement contains a mandatory security requirement as follows:

1 The Contractor must, at all times during the performance of the Contract, hold a valid Designated Organization Screening (DOS), issued by the Canadian Industrial Security Director (CISD), Public Works Government Services Canada.

2 The Contractor personnel requiring access to sensitive work site(s) must EACH hold a valid RELIABILITY STATUS, granted or approved by CISD/PWGSC.

3 The Contractor must comply with the provisions of the:

a. Security Requirements Checklist attached at Appendix "D"

b. Industrial Security Manual (Latest Edition) available at: http://ssi-iss.tpsgc-pwgsc.gc.ca/ssi-iss-services/eso-oss-eng.html

5.2 VERIFICATION OF SECURITY CLEARANCE AT BID CLOSING

1 The Bidder must hold a valid Designated Organization Screening (DOS) issued by the Canadian Industrial Security Directorate (CISD), Public Works and Government Services Canada (PWGSC), TO BE INCLUDED WITH THEIR TENDER OR PROVIDED WITHIN 48 HOURS FROM THE DATE AND TIME OF TENDER CLOSING. Verifications will be made through CISD to confirm the security

clearance status of the Bidder. Failure to comply with this requirement will render the bid non-compliant and no further consideration will be given to the bid.

2 Within 72 hours of tender closing, the General Contractor must name all of his sub-contractors, each of whom must hold a valid RELIABILITY STATUS, granted or approved by CISD/PWGSC, or any other Federal Department or Agency along with the names and birthdates or security clearance certificate numbers of all personnel who will be assigned to the project.

3 It is to be noted that any subcontractor required to perform any part of the work during the performance of the subsequent contract must also adhere to the mandatory security requirement of the contract. As well, no personnel without the required level of security will be allowed on site. It will be the responsibility of the successful bidder to ensure that the security requirement is met throughout the performance of the contract. The Crown will not be held liable or accountable for any delays or additional costs associated with the contractor's non-compliance to the mandatory security requirement. Failure to comply with the mandatory security requirement will be grounds for being declared in default of contract.

4 For any enquiries concerning the project security requirement during the bidding period, the Bidder/Tenderer must contact the Security Officer @ 613-993-8956.

6.0 WSIB (WORKPLACE SAFETY AND INSURANCE BOARD)

1 All Bidders must provide a valid WSIB certificate with their Tender or prior to contract award.

7.0 OFFICE OF THE PROCUREMENT OMBUDSMAN

1) Clause for solicitation documents and regret letters for unsuccessful bidders

The Office of the Procurement Ombudsman (OPO) was established by the Government of Canada to provide an independent venue for Canadian bidders to raise complaints regarding the award of federal contracts under $25,300 for goods and under $101,100 for services. Should you have any issues or concerns regarding the award of a federal contract below these dollar amounts, contact OPO by e-mail at boa.opo@boa-opo.gc.ca, by telephone at 1-866-734-5169, or by web at www.opo-boa.gc.ca. For more information about OPO, including the available services, please visit the OPO website.

2) Contract Clauses -Dispute Resolution

The Parties agree to make every reasonable eff01i, in good faith, to settle amicably all disputes or claims relating to or arising from the Contract, through negotiations between the Parties' representatives authorized to settle. If the Parties do not reach a settlement within 10 working days, each party hereby consents to fully participate in ai1d bear the cost of mediation led by the Procurement Ombudsman pt1rsuai1t to Subsection 22.1(3)(d) of

the *Department of Public Work and Government Services Act and Section 23 of the Procurement Ombudsman Regulations.*

The Office of the Procurement Ombudsman may be contacted by telephone at 1-866-734-5169, by e-mail at boa.opo@boa-opo.gc.ca, or by web at www.opo-boa.gc.ca.

3) Contract clause -Contract Administration

he parties understand that the Procurement Ombudsman appointed pursuant to Subsection 22.1 (1) of the *Department of Public Works and Government Services Act* will review a complaint filed by the complainant respecting the administration of the Contract if the requirements of Subsection 22.2(1) of the *Department of Public Works and Government Services Act* and Sections 15 and 16 of the *Procurement Ombudsman Regulations* have been met.

To file a complaint, the Office of the Procurement Ombudsmai1 may be contacted by e-mail at

boa.opo@boa-opo.gc.ca, by telephone at 1-866-734-5169, or by web at www.opo-boa.gc.ca.

The Departmental Representative or his designate for this project is: Sylvain Thibodeau
Telephone: **613 851-5009.**

Contracting Authority for this project is: **Alain Leroux alain.leroux@nrc-cnrc.gc.ca**
Telephone**: 613 991-9980.**

INSTRUCTIONS TO BIDDERS

Article 1 – Receipt of Tender

1a) Tenders must be received not later than the specified tender closing time. Tenders received after this time are invalid and shall not be considered, regardless of any reason for their late arrival.

1b) A letter of printed telecommunication from a bidder quoting a price shall not be considered as a valid tender unless a formal tender has been received on the prescribed Tender Form.

1c) Bidders may amend their tenders by letter or printed telecommunication provided that such amendments are received not later than the specified tender closing time.

1d) Any amendments to the tender which are transmitted by telefax must be signed and must clearly identify the tenderer.

All such amendments are to be addressed to:
National Research Council of Canada
Alain Leroux, Senior Contracting Officer
Building M-58
Montreal Road, Ottawa, Ontario
K1A 0R6

Fax: (613) 991-3297

Article 2 – Tender Form & Qualifications

1) All tenders must be submitted on the Construction Tender Form and the tender must be signed in compliance with the following requirements:

a) Limited Company: The full names of the Company and the name(s) and status of the authorized signing officer(s) must be printed in the space provided for that purpose. The signature(s) of the authorized officer(s) and the corporate seal must be affixed.

b) Partnership: The firm name and the name(s) of the person(s) signing must be printed in the space provided. One or more of the partners must sign in the presence of a witness who must also sign. An adhesive coloured seal must be affixed beside each signature.

c) Sole Proprietorship : The business name and the name of the sole proprietor must be printed in the space provided. The sole proprietor must sign in the presence of a witness who must also sign. An adhesive coloured seal must be affixed beside each signature.

2) Any alterations in the printed part of the Construction Tender Form or failure to provide the information requested therein, may render the tender invalid.

3) All space in the Construction Tender Form must be completed and any handwritten or typewritten corrections to the parts so completed must be initialed immediately to the side of the corrections by the person or persons executing the tender on behalf of the the tenderer.

4) Tenders must be based on the plans, specifications and tender documents provided.

Article 3 - Contract

1) The Contractor will be required to sign a contract similar to the Standard Contract Form for Fixed Price Construction Contracts, a blank specimen of which is enclosed in the package for reference purposes.

Article 4 – Tender Destination

1a) Tenders are to be submitted in sealed envelopes to:
National Research Council Canada
Administrative Services and Property Management Branch
1200 Montreal Road
Building M-58
Ottawa, ON
K1A 0R6

Endorsed "Tender for (insert title of work as it appears in the drawings and specifications)" and must bear the name and address of the tenderer.

1b) Unless otherwise specified, the only documents required to be submitted with the tender are the Tender form and the Bid Security.

Article 5 - Security

1a) Bid Security is required and must be submitted in one of the following forms:

i) a certified cheque payable to the Receiver General for Canada and drawn on a member of the Canadian Payments Association or a local cooperative credit society that is a member of a central cooperative credit society having membership in the Canadian Payments Association; **OR**

ii) bonds of the Government of Canada, or bonds unconditionally guaranteed as to principal and interest by the Government of Canada; **OR**

iii) a bid bond.

1b) Regardless of the Bid Security submitted, it should never be more than $250,000 maximum, calculated at 10% of the first $250,000 of the tendered price, plus 5% of any amount in excess of $250,000.

2a) Bid Security shall accompany each tender or, if forwarded separately from the tender, shall be provided not later than the specified tender closing time. Bid Security must be in the ORIGINAL form. Fax or photocopies and NOT acceptable. FAILURE TO PROVIDE THE REQUIRED BID SECURITY SHALL INVALIDATE THE TENDER.

2b) If the tender is not accepted, the Bid Security submitted pursuant to Article 8 shall be returned to the tenderer.

3a) The successful tenderer is required to provide security within 14 days of receiving notice of tender acceptance. The tenderer must furnish EITHER:

i) a Security Deposit as described in 1(b) above together with a Labour and Material Payment Bond in the amount of at least 50% of the amout payable under the contract, OR

ii) a Performance Bond and a Labour and Material Payment Bond – each in the amount of 50% of the amount payable under the contract.

3b) Should it not be possible to obtain a Labour Material Payment Bond as required under 3(a) above, on making application thereof to at least two acceptable Bonding Companies, an additional Security Deposit of a straight 10% of the amount payable under the contract must be furnished.

3c) Where a tender has been accompanied by a Security Deposit, as described in 1(b) above, the amount of the Security Deposit required under 3(a) above may be reduced by the amount of the Security Deposit which accompanied the tender.

3d) Bonds must be in an approved form and from the companies whose

bonds are acceptable to the Government of Canada. Samples of the approved form of Bid Bond, Performance Bond and Labour and Material Payment Bond and a list of acceptable Bonding Companies may be obtained from the Contracting Officer, National Research Council, Building M-58, Montreal Road, Ottawa, Ontario, K1A 0R6.

Article 6 – Interest On Security Deposits

1) Tenderers are notified that they must make their own arrangements with their bankers as to the interest, if any, on the amount of the certified cheque accompanying their tender. The Council will not pay interest on said cheque pending the awarding of the contract nor be responsible for the payments of interest under any arrangement made by the tenderers.

Article 7 – Sales Tax

1) The amount of the tender shall include all taxes as levied under the Excise Act, the Excise Tax Act, the Old Age Security Act, the Customs Act or the Customs Tariff, in force or applicable at the time.

2) In Quebec, the Provincial Sales Tax should not be included in the Tender Price as the Federal Government is exempt. Tenderers should contact the Provincial Revenue Minister to recover all taxes paid for goods and services rendered under this contract.

Tenderers must include in their Tender Price the amount of Provincial Sales Tax for which the exemption does not apply.

Article 8 – Examination of Site

1) All parties tendering shall examine the sites of the proposed work before sending in their tender and make themselves thoroughly acquainted with the same and obtain for themselves any and all information that may be necessary for the proper carrying out of the Contract. No after claim will be allowed or entertained for any work or material that may be requisite and necessary for the proper execution and completion of this Contract with the exception of that provided for under GC 35 in the General Conditions of the General Specification.

Article 9 – Discrepancies, Omissions, Etc.

1a) Bidders finding discrepancies in, or omissions from, drawings, specifications or other documents, or having any doubt as to the meaning or intent of any part thereof, should at once notify the Engineer who will send written instructions or explanation to all bidders.

1b) Neither the Engineer nor the Council will be responsible for oral instructions.

1c) Addenda or corrections issued during the time of the bidding shall be covered in the proposal. However, the contract supersedes all communications, negotiations and agreements, either written or oral, relating to the work and made prior to the date of the contract.

Article 10 – No additional Payments for Increased Costs

1) The only other adjustments in the contract price allowed are those specified in the General Conditions of the General Specification. The contract price will not be amended for change in freight rates, exchange rates, wage rates or cost of materials, plant or services.

Article 11 – Awards

1a) The Council reserves the power and right to reject tenders received from parties who cannot show a reasonable acquaintance with and preparation for the proper performance of the class of work herein specified and shown on plans. Evidence of such competence must be furnished by the tenderers if required to do so.

1b) A tenderer may be required to furnish to the Contracting Office, National Research Council of Canada, Building M-58, 1200 Montreal Road, Ottawa, Ontario, K1A 0R6, Canada, unsigned copies of the insurance requirements as covered by the Insurance Conditions of the General Specification.

1c) The Council does not bind itself to accept the lowest or any tender.

Article 12 – Harmonized Sales Tax

1) The Harmonized Sales Tax (HST) which in now in effect shall be considered an applicable tax for the purpose of this tender. However, the bidder shall NOT include any amount in the bid price for said HST. The successful contractor will indicate on each application for payment as a separate amount the appropriate HST the Owner is legally obliged to pay. This amount will be paid to the Contractor in addition to the amount certified for payment under the Contract in addition to the amount certified for payment under the Contract and will therefore not affect the Contract Price. The Contractor agrees to remit any HST collected or due to Revenue Canada.

Non-resident contractors

RST guide 804
Published August 2006
ISBN: 1-4249-2007-8 (Print), **1-4249-2009-4 (PDF), 1-4249-2008-6 (HTML)**

Publication Archived

Notice to the reader: For Retail Sales Tax (RST) – On July 1, 2010 the 13 per cent Harmonized Sales Tax (HST) took effect in Ontario replacing the existing provincial Retail Sales Tax (RST) and combining it with the federal Goods and Services Tax (GST). As a result, RST provisions described on this page and in other publications ended on June 30, 2010.

Effective July 1, 2010 this publication was archived for RST purposes **only**. Use caution when you refer to it, since it reflects the law in force for RST at the time it was released and may no longer apply.

- The information in this Guide explains the Retail Sales Tax (RST) responsibilities of a non-resident contractor who is awarded a construction contract to perform work in Ontario and their Ontario customers. Please note that this Guide replaces the previous version dated March 2001.

Non-Resident Contractor Defined

A non-resident contractor is a contractor located outside Ontario who has been awarded a construction contract to perform work in Ontario, and who has not maintained a permanent place of business in Ontario continuously for twelve months immediately prior to signing the contract, or which is not a company incorporated under the laws of Ontario. A construction contract is a contract for the erection, remodelling or repair of a building or other structure on land.
A contractor is a person who is in the business of constructing, altering, repairing or improving real property and includes, but is not limited to,

1. a general contractor and subcontractor,
2. a carpenter, bricklayer, stonemason, electrician, plasterer, plumber, painter, decorator, paver, and bridge builder,
3. a sheet metal, tile and terrazzo, heating, air conditioning, insulation, ventilating, papering, road, roofing and cement contractor, who installs or incorporates items into real property. (See RST Guide 206 - Real Property and Fixtures).

Registration and Guarantee Deposit

Non-resident contractors who are awarded a construction contract in Ontario are required to register with the Ministry of Finance (ministry), Centralized Programs Unit and post a guarantee equal to 4 per cent of the total of each Ontario contract. The guarantee can be paid in cash, by certified cheque (payable to the Minister of Finance), letter of credit or by a guarantee bond.

To register with the ministry and to obtain further information on posting a guarantee, contractors should contact the ministry's Centralized Programs Unit, 33 King Street West, PO Box 623, Oshawa, Ontario, L1H 8H7, toll-free 1 866 ONT-TAXS (1 866 668-8297) or fax to 905 435-3617.

Non-resident contractors who sell taxable goods on a supply only basis to Ontario customers, or provide taxable services in Ontario, may obtain a regular Vendor Permit to collect and remit RST on their sales. Non-resident contractors who have been issued a regular Vendor Permit must still register separately with the ministry and post a guarantee if they are awarded a construction contract in Ontario.

Letter of Compliance

After receiving the guarantee, the ministry mails out two copies of a "letter of compliance" to the contractor certifying the Retail Sales Tax (RST) requirements have been met. Contractors must give a copy of the letter to their customers.

If a copy of the compliance letter is not provided, the customer must withhold 4 per cent of all amounts payable to the non resident contractor and pay the withheld amounts to the Minister of Finance (minister). Details relating to the contract should be sent along with the payments to the Centralized Programs Unit. Customers may give the minister a guarantee bond equal to 4 per cent of the total contract price instead of making the 4 per cent payments.

Note: Customers who do not follow these requirements may be held liable for 4 per cent of all amounts payable to the non resident contractor or any other amount that the Ministry deems to be the RST payable resulting from the performance of the contract.

Calculation of RST

Fair Value

RST is payable on the "fair value" of materials, purchased or brought into Ontario, to be used for work performed in Ontario. "Fair value" includes:

- the purchase price in Canadian funds;
- all charges by the supplier for handling and delivery, and
- any federal customs duties and excise taxes paid (but not the federal Goods and Services Tax (GST)).

Contractors are also required to pay RST to Ontario suppliers on the purchase, rental or lease of taxable services, materials, machinery, or equipment.

Machinery and Equipment - Leased

If machinery or equipment is leased from a supplier outside Ontario and brought into the province, RST is payable on the lease payments for the period the machinery or equipment is in Ontario.

Machinery and Equipment - Owned by Contractor

If machinery or equipment is owned by the contractor, RST may be calculated in one of the following ways:

a. If a contractor brings machinery and equipment into Ontario for less than 12 months' use, RST is to be calculated using the following formula:

   1/36 × net book value at date of import × number of months in Ontario × tax rate

   For the purpose of this formula, RST is payable for each month or part of a month that the goods are in Ontario. A month is considered 31 consecutive days and a part month is considered more than 12 days. The RST payable is based on the number of days the machinery and equipment are located in Ontario and not the number of days the items are actually used.

Example: Equipment is brought into Ontario on March 28 and taken out on May 8. The items were in the province for 41 days. RST is payable on the first 31 days' temporary stay in Ontario vs. use of the equipment. Since the remainder (10 days) is not considered part of a month, no RST is payable on this portion.

b. If, at the time the goods are brought into Ontario, it is expected that the machinery or equipment will be in Ontario for more than twelve months, contractors must pay Retail Sales Tax (RST) on the following basis:

   net book value at date of import × tax rate

   If, at the time of import, the length of time is not known, vendors may use the formula under (a). If they later find it necessary to keep the machinery and equipment in Ontario for more than 12 months, the RST paid under (a) may be deducted from the RST payable under (b).

Using formula (a) or (b) above, contractors will calculate and remit the RST payable on the return that is filed when the contract is finished.

(See Completion of Contract section)

Manufacturing for Own Use

Contractors may need to manufacture items, such as doors and windows, for their construction contracts. Manufacturing is work done in a factory away from a construction site, or in a mobile unit or workshop that is on or near the construction site. Manufacturing occurs when raw materials are changed into manufactured goods for use in real property contracts.

Contractors are considered to be manufacturing contractors if they produce goods:
1. for their own use in real property contracts, and
2. the manufactured cost of the goods is more than $50,000 a year.

(See RST Guide 401 - Manufacturing Contractors)

Contracts with the Federal Government

Where a non-resident contractor enters into a construction contract with the federal government, for the construction of a building and/or the installation of equipment, the nature of the equipment will determine whether the contract should be let on a tax-included or tax excluded basis.

Contracts for the construction of a building and the installation of equipment that directly services that building (i.e., elevators, escalators, light fixtures, central heating and air conditioning, etc.) should be tendered on a tax -included basis. Contractors are the consumers of the materials used in fulfilling these contracts and must pay or account for RST on the materials used to complete the contracts. There is NO exemption just because the contract is with the federal government.

Contracts for the installation of equipment that becomes a fixture and does not directly service a building (i.e., material handling equipment, production machinery, communication equipment, training equipment) may be tendered on a tax-excluded basis. Contractors engaged in contracts of this nature are permitted to make tax exempt purchases of such equipment by issuing a valid Purchase Exemption Certificate (PEC) to their supplier. Only non-resident contractors who have registered with the ministry and posted a guarantee may issue a PEC.

Exemptions

Contractors may supply and install equipment or materials for certain customers that may be entitled to an exemption from RST (e.g., manufacturers, Indian band councils, farmers and diplomatic organizations). The equipment or materials, when installed, becomes real property if it is permanently attached to land, or a fixture if it is permanently attached to a building or real property structure. Since

contractors are liable for RST, they should contact the ministry to find out if the customer qualifies for exemption before tendering the contract on a tax-excluded basis.

Status Indians, Indian Bands and Band Councils

Non-resident contractors may purchase building materials exempt from Retail Sales Tax (RST) for certain buildings and structures situated on reserves. The cost of such projects must be paid by the band council, and the buildings must provide a community service for the reserve. Contracts for the construction of an exempt community building project should be made on an RST-excluded basis. Non-resident contractors may purchase the materials exempt from RST by providing suppliers with a valid Purchase Exemption Certificate (PEC). As noted previously, only non-resident contractors who have registered with the ministry and posted a guarantee may issue a PEC. (See RST Guide 204 - Purchase Exemption Certificates).

Non-resident contractors must pay RST on items purchased for incorporation into a building or structure built for individual status Indians on a reserve. (See RST Guide 808 - Status Indians, Indian Bands and Band Councils).

Completion of Contract

When a contract is completed, non-resident contractors who were required to post a guarantee must complete a Non-Resident Contractor Retail Sales Tax Return [PDF - 92 KB] that is provided by the ministry.

If a contractor's guarantee was given in cash or by certified cheque, the amount of the deposit can be deducted from the RST liability owed by the contractor. If the liability is greater than the deposit, the amount remaining must be paid by the contractor. If the deposit is more than the liability, the contractor will receive a refund.

If a guarantee bond was posted instead of cash, the bond will be discharged once the RST liability is paid in full.

All returns are subject to audit.

Legislative References

- Retail Sales Tax Act, Subsections 19(2) and 39(3)(4) and (5)
- Regulation 1012 under the Act, Subsections 15.3(1)(2)(5)(6) and (7)
- Regulation 1013 under the Act, Sections 1 and 3

For More Information

The information contained in this publication is only a guideline. For more information, please contact the Ontario Ministry of Finance at 1 866 ONT-TAXS (1 866 668-8297) or visit our website at ontario.ca/finance.

Acceptable Bonding Companies

Published September 2010

The following is a list of insurance companies whose bonds may be accepted as security by the government.

1. Canadian Companies

- ACE INA Insurance
- Allstate Insurance Company of Canada
- Ascentus Insurance Ltd. (Surety only)
- Aviva Insurance Company of Canada
- AXA Insurance (Canada)
- AXA Pacific Insurance Company
- Canadian Northern Shield Insurance Company
- Certas Direct Insurance Company (Surety only)
- Chartis Insurance Company of Canada (formerly AIG Commercial Insurance Company of Canada)
- Chubb Insurance Company of Canada
- Commonwealth Insurance Company
- Co-operators General Insurance Company
- CUMIS General Insurance Company
- The Dominion of Canada General Insurance Company
- Echelon General Insurance Company (Surety only)
- Economical Mutual Insurance Company
- Elite Insurance Company
- Everest Insurance Company of Canada
- Federated Insurance Company of Canada
- Federation Insurance Company of Canada
- Gore Mutual Insurance Company
- Grain Insurance and Guarantee Company
- The Guarantee Company of North America
- Industrial Alliance Pacific General Insurance Corporation
- Intact Insurance Company
- Jevco Insurance Company (Surety only)
- Lombard General Insurance Company of Canada
- Lombard Insurance Company
- Markel Insurance Company of Canada
- The Missisquoi Insurance Company
- The Nordic Insurance Company of Canada
- The North Waterloo Farmers Mutual Insurance Company (Fidelity only)
- Novex Insurance Company (Fidelity only)
- The Personal Insurance Company
- Pilot Insurance Company
- Quebec Assurance Company
- Royal & Sun Alliance Insurance Company of Canada
- Saskatchewan Mutual Insurance Company
- Scottish & York Insurance Co. Limited
- The Sovereign General Insurance Company
- TD General Insurance Company
- Temple Insurance Company
- Traders General Insurance Company

- Travelers Guarantee Company of Canada
- Trisura Guarantee Insurance Company
- The Wawanesa Mutual Insurance Company
- Waterloo Insurance Company
- Western Assurance Company
- Western Surety Company

2. Provincial Companies

Surety bonds issued by the following companies may be accepted provided that the contract of suretyship was executed in a province in which the company is licensed to do business as indicated in brackets.

- AXA Boreal Insurance Company (P.E.I., N.B., Que., Ont., Man., B.C.)
- AXA Boreal Insurance Company (P.E.I., N.B., Que., Ont., Man., B.C.)
- ALPHA, Compagnie d'Assurances Inc. (Que.)
- Canada West Insurance Company (Ont., Man., Sask, Alta., B.C., N.W.T.) (Surety only)
- The Canadian Union Assurance Company (Que.)
- La Capitale General Insurance Inc. (Nfld. & Lab., N.S., P.E.I., Que.(Surety only), Man., Sask., Alta., B.C., Nun., N.W.T., Yuk.)
- Coachman Insurance Company (Ont.)
- Continental Casualty Company (Nfld. & Lab., N.S., P.E.I., N.B., Que., Ont., Man., Sask., Alta., B.C., Nun., N.W.T., Yuk.)
- GCAN Insurance Company (Nfld. & Lab., N.S., P.E.I., N.B., Que., Ont., Man., Sask., Alta., B.C., Nun., N.W.T., Yuk.)
- The Insurance Company of Prince Edward Island (N.S., P.E.I., N.B.)
- Kingsway General Insurance Company (N.S., N.B., Que., Ont., Man., Sask., Alta., and B.C.)
- Liberty Mutual Insurance Company (Nfld. & Lab., N.S., P.E.I., N.B., Que., Ont., Man., Sask., Alta., B.C., Nun., N.W.T., Yuk.)
- Manitoba Public Insurance Corporation (Man.)
- Norgroupe Assurance Générales Inc.
- Orleans General Insurance Company (N.B., Que., Ont.)
- Saskatchewan Government Insurance Office (Sask.)
- SGI CANADA Insurance Services Ltd. (Ont., Man., Sask., Alta.)
- L'Unique General Insurance Inc. (Nfld. & Lab., N.S., P.E.I., N.B., Que.(Surety only), Ont.(Surety only), Man., Sask., Alta., B.C.(Surety only), Nun., N.W.T., Yuk.)

3. Foreign Companies

- Aspen Insurance UK Limited
- Compagnie Française d'Assurance pour le Commerce Extérieur (Fidelity only)
- Eagle Star Insurance Company Limited
- Ecclesiastical Insurance Office Public Limited Company (Fidelity only)
- Lloyd's Underwriters
- Mitsui Sumitomo Insurance Company, Limited
- NIPPONKOA Insurance Company, Limited
- Sompo Japan Insurance Inc.
- Tokio Marine & Nichido Fire Insurance Co., Ltd.
- XL Insurance Company Limited (Surety only)
- Zurich Insurance Company Ltd

Articles of Agreement

Standard Construction Contract – Articles of Agreement
(23/01/2002)

A1 Contract Documents

A2 Date of Completion of Work and Description of Work

A3 Contract Amount

A4 Contractor’s Address

A5 Unit Price Table

Articles of Agreement

These Articles of Agreement made in duplicate this day of .

Between

Her Majesty the Queen, in right of Canada (referred to in the contract documents as " Her Majesty") represented by the National Research Council Canada (referred to in the contract documents as the "Council")

and

(referred to in the contract documents as the "Contractor")

Witness that in consideration for the mutual promises and obligations contained in the contract, Her Majesty and the Contractor covenant and agree as follows:

A1 Contract Documents

(23/01/2002)

1.1 Subject to A1.4 and A1.5, the documents forming the contract between Her Majesty and the Contractor, referred to herein as the contract documents, are

1.1.1 these Articles of Agreement,

1.1.2 the document attached hereto, marked "A" and entitled "Plans and Specifications", referred to herein as the Plans and Specifications,

1.1.3 the document attached hereto, marked "B" and entitled "Terms of Payment", referred to herein as the Terms of Payment,

1.1.4 the document attached hereto, marked "C" and entitled "General Conditions", referred to herein as the General Conditions,

1.1.5 the document attached hereto, marked "D" and entitled "Labour Conditions", referred to herein as the Labour Conditions,

1.1.6 the document attached hereto, marked "E" and entitled "Insurance Conditions", referred to herein as the Insurance Conditions,

1.1.7 the document attached hereto, marked "F" and entitled "Contract Security Conditions", referred to herein as the Contract Security Conditions, and

1.1.8 any amendment or variation of the contract documents that is made in accordance with the General Conditions.

1.1.9 the document entitled Fair Wage Schedules for Federal Construction Contracts referred to herein as Fair Wage Schedules

1.1.10

The Council hereby designates of of the Government of Canada as the Engineer for the purposes of the contract, and for all purposes of or incidental to the contract, the Engineer's address shall be deemed to be:

1.2 **In the contract**

1.3.1 " Fixed Price Arrangement" means that part of the contract that prescribes a lump sum as payment for performance of the work to which it relates; and

1.3.2 " Unit Price Arrangement" means that part of the contract that prescribes the product of a price multiplied by a number of units of measurement of a class as payment for performance of the work to which it relates.

1.3 Any of the provisions of the contract that are expressly stipulated to be applicable only to a Unit Price Arrangement are not applicable to any part of the work to which a Fixed Price Arrangement is applicable.

1.4 Any of the provisions of the contract that are expressly stipulated to be applicable only to a Fixed Price Arrangement are not applicable to any part of the work to which a Unit Price Arrangement is applicable.

A2 Date of Completion of Work and Description of Work

(23/01/2002)

2.1 The contractor shall, between the date of these Articles of Agreement and the **,** , in the careful and workmanlike manner, diligently perform and complete the following work:

which work is more particularly described in the Plans and Specifications.

A3 Contract Amount

(23/01/2002)

3.1 Subject to any increase, decrease, deduction, reduction or set-off that may be made under the Contract, Her Majesty shall pay the Contractor at the times and in the manner that is set out or referred to in the Terms of Payment

3.1.1 the sum of (GST/HST extra), in consideration for the performance of the work or the part thereof that is subject to Fixed Price Arrangement, and

3.1.2 a sum that is equal to the aggregate of the products of the number of units of Measurement of each class of labour, plant and material that is set out in a Final Certificate of Measurement referred to in GC44.8 multiplied in each case by the appropriate unit price that is set out in the Unit Price Table in consideration for the performance of the work or the part thereof that is subject to a Unit Price Arrangement.

3.2 For the information and guidance of the Contractor and the persons administering the contract on behalf of Her Majesty, but not so as to constitute a warranty , representation or undertaking of any nature by either party, it is estimated that the total amount payable by Her Majesty to the Contractor for the part of the work to which a Unit Price Arrangement is applicable will be approximately $N/A

3.3 A3.1.1 is applicable only to a Fixed Price Arrangement.

3.4 A3.1.2 and A3.2 applicable only to a Unit Price Arrangement.

A4 Contractor’s Address

(23/01/2002)

4.1 For all purposes of or incidental to the contract, the Contractor’s address shall be deemed to be:

A5 Unit Price Table

(23/01/2002)

5.1 Her Majesty and the Contractor agree that the following table is the Unit Price Table for the purposes of the contract.

Column 1 Item	**Column 2** Class of Labour Plant Or Material	**Column 3** Unit of Measurement	**Column 4** Estimated Total Quantity	**Column 5** Price per Unit	**Column 6** Estimated Total Price
		N/A			

5.2 The Unit Price Table that is set out in A5.1 designates the part of the work to which a Unit Price Arrangement is applicable.

5.3 The part of the work that is not designated in the Unit Price Table referred to in A5.2 is the part of the work to which a Fixed Price Arrangement is applicable.

Articles of Agreement

Signed on behalf of Her Majesty by

_____

as Senior Contracting Officer

and_____

as_____

of the **National Research Council Canada**

on the_____

day of _____

Signed, sealed and delivered by

_____

as_____and
Position

by_____

as_____
Position **Seal**

of

on the_____

day of_____

END OF TABLE OF CONTENTS

1. SCOPE OF WORK

.1 Work under this contract covers the roof replacement of various roof sections in the Council's Building M-58 of the National Research Council.

2. DRAWINGS

.1 The following drawings illustrate the work and form part of the contract documents:

5397-CS1	COVER SHEET,
5397-A01	DEMOLITION AND CONSTRUCTION ROOF PLANS,
5397-A02	TYPICAL ROOF REPLACEMENT DETAILS,
5397-A03	TYPICAL ROOF REPLACEMENT DETAILS,
5397-A04	ROOF CROSS SECTIONS AND TYPICAL ROOF REPLACEMENT DETAILS,
5397-M01	ROOF TOP A/C AND EXHAUST FAN REMOVAL AND DUCTWORK MODIFICATIONS.

3. COMPLETION

.1 Complete all work within eight (8) weeks after receipt of notification of acceptance of tender.

4. GENERAL

.1 The word "provide" in this Specification means to supply and install.

.2 Provide items mentioned in either the drawings or the specification.

5. SPECIFIED ACCEPTABLE & ALTERNATIVE EQUIPMENT & MATERIALS

.1 Materials and equipment scheduled and/or specified on the drawings or in the specifications have been selected to establish a performance and quality standard. In most cases, acceptable manufacturers are stated for any material or equipment specified by manufacturer's name and model number. Contractors may base their tender price on materials and equipment supplied by any of the manufacturers' names as acceptable for the particular material or equipment.

.2 In addition to the manufacturers specified or named as acceptable, you may propose alternative manufacturers of materials or equipment to the Departmental Representative for acceptance. For a product to be considered as an alternative product substitute, make a written application to the Departmental Representative during the tender period, not later than seven (7) working days before tender closing.

.3 Certify in writing that the alternative meets all requirements of the specified material or equipment. In addition, it shall be understood that all costs required by or as a result of acceptance or proposed alternatives, will be borne by the contractor.

.4 Approval of alternatives will be signified by issue of an Addendum to the Tender Documents.

.5 Any alternative manufacturers or materials submitted which are incomplete and cannot be evaluated, or are later than seven (7) working days before tender closing date or after the tender period, will not be considered.

6. MINIMUM STANDARDS

.1 Conform to or exceed minimum acceptable standards of the various applicable federal, provincial and municipal codes such as The National Building Code, The National Fire Code, Canadian Plumbing Code, Canadian Electrical Code, Canadian Code for Construction Safety and the Provincial Construction Safety Act.

.2 Work to conform to referenced standards and codes as reaffirmed or revised to date of specification.

7. WORKPLACE HAZARDOUS MATERIAL INFORMATION SYSTEM (WHMIS)

.1 The general contractor shall comply with Federal and Provincial legislation regarding the WHMIS. The contractor's responsibilities include, but are not limited to the following:

.1 To ensure that any controlled product brought on site by the contractor or sub-contractor is labeled;

.2 To make available to the workers and the Departmental Representative, Material Safety Data Sheets (MSDS) for these controlled products;

.3 To train own workers about WHMIS, and about the controlled products that they use on site;

.4 To inform other contractors, sub-contractors, the Departmental Representative, authorized visitors and outside inspection agency personnel about the presence and use of such products on the site.

The site foreman or superintendent must be able to demonstrate, to the satisfaction of the Departmental Representative, that he/she has had WHMIS training and is knowledgeable in its requirements. The Departmental Representative can require replacement of this person if this condition or implementation of WHMIS is not satisfactory.

8. REQUIREMENTS OF BILL 208, SECTION 18(a)

Under the requirements of Bill 208 of the Ontario Ministry of Labour Occupational Health & Safety Act, the following designated substances may be encountered while performing the work described in these contract documents:

.1 Acrylonitrile, Isocyanates, Arsenic, Lead, Asbestos, Mercury, Benzene, Silica, Vinyl Chloride, and Ethylene Oxide

.1 It is the responsibility of the general contractor to ensure that each prospective subcontractor for this project has received a copy of the above list.

.2 The general contractor is advised to take the following precautions when dealing with the above substances.

9. COST BREAKDOWN

.1 Submit, for approval by the Departmental Representative, a cost breakdown of tender 72 hours after the contract is awarded.

.2 Use the approved cost breakdown as the basis for submitting all claims.

.3 Request Departmental Representative's verbal approval to amount of claim prior to preparing and submitting the claim in its final form.

10. SUB-TRADES

.1 Submit as part of the tender form a complete list of sub trades.

11. PERSONNEL SECURITY AND IDENTIFICATION

.1 All persons employed by the contractor, or by any subcontractor and present on the site must be security cleared in accordance with the requirements of the Section entitled Special Instructions to Tenderers.

.2 All such persons must wear and keep visible identification badges as issued by the Security Office of NRC.

12. WORKING HOURS AND SECURITY

.1 Normal working hours on the NRC property are from 8:00 a.m. until 4:30 p.m., Monday to Friday inclusive, except statutory holidays.

.2 At all other times, special written passes are required for access to the building site.

~~.3~~ Before scheduling any work outside normal working hours, obtain permission from the Departmental Representative to perform the specific tasks.

.4 An escort may be required whenever working outside normal hours. Contractor to bear the associated costs.

13. SCHEDULE

.1 The contractor shall prepare a detailed schedule, fixing the date for commencement and completion of the various parts of the work and update the said schedule. Such schedule shall be made available to the Departmental Representative not later than two weeks after the award of the contract and prior to commencement of any work on site.

.2 Notify Departmental Representative in writing of any changes in the schedule.

.3 Five (5) day(s) before the scheduled completion date, arrange to do an interim inspection with the Departmental Representative.

14. PROJECT MEETINGS

.1 Hold regular project meetings at times and locations approved by the Departmental Representative.

.2 Notify all parties concerned of meetings to ensure proper coordination of work.

.3 Departmental Representative will set times for project meetings and assume responsibility for recording and distributing minutes.

15. SHOP DRAWINGS

.1 Submit to Departmental Representative for review, shop drawings, product data and samples specified within two (2) weeks after contract award.

.2 Submit to Departmental Representative for review a complete list of all shop drawings, product data and samples specified and written confirmation of corresponding delivery dates within one (1) week after shop drawings, product data and samples approval date. This list shall be updated on a bi-weekly basis and any changes to the list shall be immediately notified in writing to the Departmental Representative.

.3 Review shop drawings, data sheets and samples prior to submission.

.4 Submit electronic copy of all shop drawings and product data and samples for review, unless otherwise specified.

.5 Review of shop drawings and product data by the Departmental Representative does not relieve the contractor of the responsibility for errors and omissions and for the conformity with contract documents.

16. SAMPLES AND MOCK-UPS

.1 Submit samples in sizes and quantities as specified.

.2 Where colour, pattern or texture is criterion, submit full range of samples.

.3 Construct field samples and mock-ups at locations acceptable to Departmental Representative.

.4 Reviewed samples or mock-ups will become standards of workmanship and material against which installed work will be checked on the project.

17. MATERIALS AND WORKMANSHIP

.1 Install only new materials on this project unless specifically noted otherwise.

.2 Only first class workmanship will be accepted, not only with regard to safety, efficiency, durability, but also with regard to neatness of detail and performance.

18. WORK & MATERIALS SUPPLIED BY OWNER

.1 Work and materials not included in this contract are described on drawings and in this specification.

.2 Deliver to a storage place, as directed by the Departmental Representative, all materials returned to the Owner.

.3 Unless otherwise specified, accept owner-supplied materials at their storage location and provide all transportation as required.

.4 General Contractor's duties:

.1 Unload at site.

.2 Promptly inspect products and report damaged or defective items.

.3 Give written notification to the Departmental Representative for items accepted in good order.

.4 Handle at site, including uncrating and storage.

.5 Repair or replace items damaged on site.

.6 Install, connect finished products as specified.

19. SITE ACCESS

.1 Make prior arrangements with the Departmental Representative before starting work or moving materials and equipment on site.

.2 Obtain approval of Departmental Representative for regular means of access during the construction period.

.3 Obtain approval of Departmental Representative before temporarily suspending operations on site; before returning to the site and before leaving the site at the end of the job.

.4 Provide and maintain access to site.

.5 Build and maintain temporary roads and provide snow removal during period of work.

.6 Make good any damage and clean up dirt, debris, etc., resulting from contractor's use of existing roads.

20. USE OF SITE

.1 Restrict operations on the site to the areas approved by the Departmental Representative

.2 Locate all temporary structures, equipment, storage, etc., to the designated areas.

.3 Restrict parking to the designated areas.

21. ACCEPTANCE OF SITE

.1 Inspect the site before commencing work, review any unexpected conditions with the Departmental Representative.

.2 Commencement of work will imply acceptance of existing conditions.

22. SITE OFFICE & TELEPHONE

.1 Contractor to erect a temporary site office at his own expense.

.2 Install and maintain a telephone, if necessary.

.3 Use of NRC phones is not permitted unless in the case of an emergency.

23. SANITARY FACILITIES

.1 Provide sanitary facilities, and bear all associated costs.

24. TEMPORARY SERVICES

.1 A source of temporary power will be made available in the area. Bear all costs to make connections to the power source and perform distribution on site.

.2 Provide all load centres, breakers, conduit, wiring, disconnects, extension cords, transformers, as required from the source of power.

.3 Power is to be used only for power tools, lighting, controls, motors, and not for space heating.

.4 A source of temporary water will be made available if required.

.5 Bear all costs associated with distributing the water to the required locations.

.6 Comply with NRC requirements when connecting to existing systems in accordance with the articles entitled "Co-operation" and "Service Interruptions" of this section.

25. DOCUMENTS REQUIRED AT WORK SITE

.1 The contractor shall keep on the site, one (1) up-to-date copy of all contract documents, including specifications, drawings, addenda, shop drawings, change notices, schedule and any reports or bulletins pertaining to the work, in good order, available to the Departmental Representative and to his / her representatives at all times.

.2 At least one (1) copy of specifications and drawings shall be marked by the contractor to show all work "As Built" and shall be provided to the Departmental Representative with the Application for Payment and for the Final Certificate of Completion.

26. CO-OPERATION

.1 Co-operate with NRC staff in order to keep disruption of normal research work to an absolute minimum.

.2 Work out in advance, a schedule for all work which might disrupt normal work in the building.

.3 Have schedule approved by the Departmental Representative.

.4 Notify the Departmental Representative in writing, 72 hours prior to any intended interruption of facilities, areas, corridors, mechanical or electrical services and obtain requisite permission.

27. PROTECTION AND WARNING NOTICES

.1 Provide all materials required to protect existing equipment.

.2 Erect dust barriers to prevent dust and debris from spreading through the building.

.3 Place dust protection in the form of cover sheets over equipment and furniture and tape these sheets to floors, to ensure no dust infiltration.

.4 Repair or replace any and all damage to Owner's property caused during construction, at no cost to the Owner and to the satisfaction of the Departmental Representative.

.5 Protect the buildings, roads, lawns, services, etc. from damage which might occur as a result of this work.

.6 Plan and co-ordinate the work to protect the buildings from the leakage of water, dust, etc.

.7 Ensure that all doors, windows, etc., that could allow transfer of dust, noise, fumes, etc., to other areas of the building are kept closed.

.8 Be responsible for security of all areas affected by the work under the Contract until acceptance by NRC. Take all necessary precautions to prevent entry to the work area by unauthorized persons and guard against theft, fire and damage by any cause. Secure working area at the end of each day’s work and be responsible for same.

.9 Provide and maintain adequate safety barricades around the work sites to protect NRC personnel and the public from injury during the construction.

.10 Post warnings, in all instances where possible injury could occur such as Work Overhead, Hard Hat Areas, etc. or as required by the Departmental Representative.

.11 Provide temporary protective enclosures over building entrances and exits to protect pedestrians. All enclosures to be structurally sound against weather and falling debris.

28. BILINGUALISM

.1 Ensure that all signs, notices, etc. are posted in both official languages.

.2 Ensure that all identification of services called for by under this contract are bilingual.

29. LAYOUT OF WORK

.1 Location of equipment, fixtures, outlets and openings indicated on drawings or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with the manufacturer’s recommendations for safety, access and maintenance.

.3 Employ competent person to lay out work in accordance with the contract documents.

30. DISCREPANCIES & INTERFERENCES

.1 Prior to the start of the work, examine drawings and specifications. Report at once to the Departmental Representative, any defects, discrepancies, omissions or interferences affecting the work.

.2 Contractor to immediately inform the Departmental Representative in writing, of any discrepancies between the plans and the physical conditions so the Departmental Representative may promptly verify same.

.3 Any work done after such a discovery, until authorized, is at the contractor's risk.

.4 Where minor interferences as determined by the Departmental Representative are encountered on the job and they have not been pointed out on the original tender or on the plans and specifications, provide offsets, bends or reroute the services to suit job conditions at no extra cost.

.5 Arrange all work so as not to interfere in any way with other work being carried out.

31. MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.2 Notify the Departmental Representative in writing of any conflict between these specifications and manufacturer's instruction. Departmental Representative will designate which document is to be followed.

32. TEMPORARY HEATING AND VENTILATING

.1 Bear the costs of temporary heat and ventilation during construction including costs of installation, fuel, operation, maintenance, and removal of equipment.

.2 Use of direct-fired heaters discharging waste products into the work areas will not be permitted unless prior approval is given by the Departmental Representative.

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

.1 Facilitate progress of work.

.2 Protect work and products against dampness and cold.

.3 Reduce moisture condensation on surfaces to an acceptable level.

.4 Provide ambient temperature and humidity levels for storage, installation and curing of materials.

.5 Provide adequate ventilation to meet health regulations for a safe working environment.

.4 Maintain minimum temperature of 10 °C (50 °F) or higher where specified as soon as finishing work is commenced and maintain until acceptance by the Departmental Representative. Maintain ambient temperature and humidity levels as required for comfort of NRC personnel.

.5 Prevent hazardous or unhealthy accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction including also, storage areas and sanitary facilities.

.1 Dispose of exhaust materials in a manner that will not result in a harmful or unhealthy exposure to persons.

.6 Maintain strict supervision of operation of temporary heating and ventilating equipment.

.1 Enforce conformance with applicable codes and standards.

.2 Comply with instructions of the Departmental Representative including provision of full-time watchman services when directed.

.3 Enforce safe practices.

.4 Vent direct-fired combustion units to outside.

.7 Submit tenders assuming existing or new equipment and systems will not be used for temporary heating and ventilating.

.8 After award of contract, Departmental Representative may permit use of the permanent system providing agreement can be reached on:

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

.2 Methods of ensuring that heating medium will not be wasted and in the case of steam, agreement on what is to be done with the condensate.

.3 Saving on contract price.

.4 Provisions relating to guarantees on equipment.

33. CONNECTIONS TO AND INTERRUPTIONS TO EXISTING SERVICES

.1 Where work involves breaking into or connecting to existing services, carry out work at times and in the manner agreed to by the Departmental Representative and by authorities having jurisdiction, with minimum disruption to NRC Personnel and vehicular traffic and minimum service interruption. Do not operate any NRC equipment or plant.

.2 Before commencing work, establish location and extent of service lines in area of work and notify Departmental Representative of findings.

.3 Submit a schedule to and obtain approval from the Departmental Representative for any shut-down or closure of active service or facility; allow minimum 72 hours notice. Adhere to approved schedule and provide notice to the Departmental Representative.

.4 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

.5 Provide detours, bridges, alternate feeds, etc., as required to minimize disruptions.

.6 Protect existing services as required and immediately make repairs if damage occurs.

.7 Remove any abandoned service lines as indicated on the contract documents and as approved by the Departmental Representative; cap or otherwise seal lines at cut-off points. Record and provide a copy to the Departmental Representative of locations of maintained, re-routed and abandoned service lines.

34. CUTTING AND PATCHING

.1 Cut existing surfaces as required to accommodate new work.

.2 Remove all items as shown or specified.

.3 Patch and make good with identical materials, the surfaces that have been disturbed, cut or damaged, to the satisfaction of the Departmental Representative.

.4 Where new pipes pass through existing construction, core drill an opening. Size openings to leave 12mm (1/2") clearance around the pipes or pipe insulation. Do not drill or cut any surface without the approval of the Departmental Representative.

.5 Obtain written approval of the Departmental Representative before cutting openings through existing or new structural members.

.6 Seal all openings where cables, conduits or pipes pass through walls with an acoustic sealant conforming to CAN/CGSB-19.21-M87.

.7 Where cables, conduits and pipes pass through fire rated walls and floors, pack space between with compressed glass fibres and seal with fire stop caulking in accordance with CAN/CGSB-19.13-M87 AND NBC 3.1.7.

35. FASTENING DEVICES

.1 Do not use explosive actuated tools, without first obtaining permission from the Departmental Representative.

.2 Comply with the requirements of CSA A-166 (Safety Code for Explosive Actuated Tools).

.3 Do not use any kind of impact or percussion tool without first obtaining permission from the Departmental Representative.

36. OVERLOADING

.1 Ensure that no part of the building or work is subjected to a load which will endanger safety or cause permanent deformation or structural damage.

37. DRAINAGE

.1 Provide temporary drainage and pumping as required to keep excavations and site free of water.

38. ENCLOSURE OF STRUCTURES

.1 Construct and maintain all temporary enclosures as required to protect foundations, sub-soil, concrete, masonry, etc., from frost penetration or damage.

.2 Maintain in place until all chances of damage are over and proper curing has taken place.

.3 Provide temporary weather tight enclosures for exterior openings until permanent sash and glazing and exterior doors are installed.

.4 Provide lockable enclosures as required to maintain the security of NRC facilities and be responsible for the same.

.5 Provide keys to NRC security personnel when required.

.6 Lay out the work carefully and accurately and verify all dimensions and be responsible for them. Locate and preserve general reference points.

.7 Throughout the course of construction, keep continuously acquainted with field conditions, and the work being developed by all trades involved in the project. Maintain an awareness of responsibility to avoid space conflict with other trades.

.8 Conceal all services, piping, wiring, ductwork, etc., in floors, walls or ceilings except where indicated otherwise.

39. STORAGE

.1 Provide storage as required to protect all tools, materials, etc., from damage or theft and be responsible for the same.

.2 Do not store flammable or explosive materials on site without the authorization of the Departmental Representative.

40. GENERAL REVIEW

.1 Periodic review of the contractor's work by the Departmental Representative does not relieve the contractor of the responsibility of making the work in accordance with contract documents. Contractor shall carry out his own quality control to ensure that the construction work is in accordance with contract documents.

.2 Inform the Departmental Representative of any impediments to the installation and obtain his / her approval for actual location.

41. INSPECTION OF BURIED OR CONCEALED SERVICES

.1 Prior to concealing any services that are installed, ensure that all inspection bodies concerned, including NRC, have inspected the work and have witnessed all tests. Failure to do so may result in exposing the services again at the contractor's expense.

42. TESTING

.1 On completion, or as required by local authority inspectors and/or Departmental Representative during progress of work and before any services are covered up and flushing is complete, test all installations in the presence of the Departmental Representative.

.2 Obtain and hand to the Departmental Representative all acceptance certificates or test reports from authority having jurisdiction. The project will be considered incomplete without the same.

43. PARTIAL OCCUPANCY

.1 NRC may request partial occupancy of the facility if the contract extends beyond the expected completion date.

.2 Do not restrict access to the building, routes, and services.

.3 Do not encumber the site with materials or equipment.

44. DISPOSAL OF WASTES

.1 Dispose of waste materials including volatiles, safely off NRC property. Refer to the section entitled "General and Fire Safety Requirements” included as part of this specification.

45. CLEAN-UP DURING CONSTRUCTION

.1 On a daily basis, maintain project site and adjacent area of campus including roofs, free from debris and waste materials.

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

46. FINAL CLEAN-UP

.1 Upon completion do a final clean-up to the satisfaction of the Departmental Representative.

.2 Clean all new surfaces, lights, existing surfaces affected by this work, replace filters, etc.

.3 Clean all resilient flooring and prepare to receive protective finish. Protective finish applied by NRC

47. WARRANTY AND RECTIFICATION OF DEFECTS IN WORK

.1 Refer to General Conditions "C", section GC32.

.2 Ensure that all manufacturers' guarantees and warranties are issued in the name of the **General** Contractor and the National Research Council.

48. MAINTENANCE MANUALS

.1 Provide three (3) bilingual copies of maintenance manuals or two English and two French maintenance manuals immediately upon completion of the work and prior to release of holdbacks.

.2 Manuals to be neatly bound in hard cover loose leaf binders.

.3 Manuals to include operating and maintenance instructions, all guarantees and warranties, shop drawings, technical data, etc., for the material and apparatus supplied under this contract.

.4 Provide an electronic copy, PDF format.

END OF SECTION

1. GENERAL CONSTRUCTION SAFETY REQUIREMENTS

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

.2 The Contractor shall be solely responsible for the construction safety of both its employees and those of its sub-contractors at the work site, and for initiating, maintaining and supervising safety precautions, programs and procedures in connection with the performance of the work.

.3 The Contractor shall comply with all Federal, Provincial and Municipal safety codes and regulations and the Occupational Health and Safety Act and the Workplace Safety and Insurance Board. In the event of any conflict between any provisions in legislation or codes, the most stringent provisions shall apply.

.4 Periodic review of the contractor's work by the Departmental Representative, using the criteria of the contract documents, does not relieve the contractor of his safety responsibilities in carrying out the work in accordance with the contract documents. The contractor shall consult with the Departmental Representative to ensure that this responsibility is carried out.

.5 The Contractor shall ensure that only competent personnel are permitted to work on site. Throughout the term of the contract, any person will be removed from the site who is not observing or complying with the safety requirements.

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

.7 Following a project and site hazard assessment, the Contractor shall develop a Site Specific Safety Plan based on the following minimum requirements:

- .1 Provide a safety board mounted in a visible location on the project site, with the following information included thereon:
  - .1 Notice of Project
  - .2 Site specific Safety Policy
  - .3 Copy of Ontario Health and Safety Act
  - .4 Building Schematic showing emergency exits
  - .5 Building emergency procedures
  - .6 Contact list for NRC, Contractor and all involved sub-contractors
  - .7 Any related MSDS sheets
  - .8 NRC Emergency phone number

.8 The Contractor shall provide competent personnel to implement its safety program and those of any Health and Safety Act legislation applicable at this project location, and to ensure they are being complied with.

.9 The Contractor shall provide safety orientation to all its employees as well as those of any subcontractors under its jurisdiction.

.10 The Departmental Representative will monitor to ensure that safety requirements are met and that safety records are properly kept and maintained. Continued disregard for safety standards can cause the contract to be cancelled and the Contractor or sub-contractors removed from the site.

.11 The Contractor will report to the Departmental Representative and jurisdictional authorities, any accident or incident involving Contractor or NRC personnel or the public and/or property arising from the Contractor's execution of the work.

.12 If entry to a laboratory is required as part of the work of the Contractor, a safety orientation shall be provided to all his employees as well as those of any subcontractors regarding lab safety requirements and procedures, as provided by the Researcher or the Departmental Representative.

2. FIRE SAFETY REQUIREMENTS

.1 Authorities

1. The Fire Commissioner of Canada (FC) is the authority for fire safety at NRC.
2. For the purpose of this document, "Departmental Representative" will be deemed as the NRC person in charge of the project and who will enforce these Fire Safety Requirements.
3. Comply with the following standards as published by the Office of the Fire Commissioner of Canada:
    a. Standard No. 301 - June 1982 "Standard for Construction Operations";
    b. Standard No. 302 - June 1982 "Standard for Welding and Cutting".

.2 Smoking

.1 Smoking is prohibited inside all NRC buildings, as well as roof areas.

.2 Obey all "NO SMOKING" signs on NRC premises.

.3 Hot Work

.1 Prior to commencement of any "Hot Work" involving welding, soldering, burning, heating, use of torches or salamanders or any open flame, obtain a Hot Work Permit from the Departmental Representative.

.2 Prior to commencement of "Hot Work", review the area of hot work with the Departmental Representative to determine the level of fire safety precautions to be taken.

.4 Reporting Fires

.1 Know the exact location of the nearest Fire Alarm Pull Station and telephone, including the emergency phone number.

.2 REPORT immediately, all fire incidents as follows:

.1 Activate nearest fire alarm pull station and;

.2 Telephone the following emergency phone number as appropriate:

FROM AN NRC PHONE	**333**
FROM ANY OTHER PHONE	**(613) 993-2411**

4. When reporting a fire by phone, give the location of fire, building number and be prepared to verify location.
5. The person activating fire alarm pull station must remain at a safe distance from the scene of the fire but readily available to provide information and direction to the Fire Department personnel.

.5 Interior and Exterior Fire protection & Alarm Systems

.1 DO NOT OBSTRUCT OR SHUT OFF FIRE PROTECTION EQUIPMENT OR SYSTEMS, INCLUDING BUT NOT LIMITED TO FIRE ALARM SYSTEMS, SMOKE/HEAT DETECTORS, SPRINKLER SYSTEM, PULL STATIONS, EMERGENCY CALL BUTTONS AND PA SYSTEMS, WITHOUT AUTHORIZATION FROM THE DEPARTMENTAL REPRESENTATIVE.

.2 WHEN ANY FIRE PROTECTION EQUIPMENT IS TEMPORARILY SHUT DOWN, ALTERNATIVE MEASURES AS PRESCRIBED BY THE DEPARTMENTAL REPRESENTATIVE SHALL BE TAKEN TO ENSURE THAT FIRE PROTECTION IS MAINTAINED.

.3 DO NOT LEAVE FIRE PROTECTION OR ALARM SYSTEMS INACTIVE AT THE END OF A WORKING DAY WITHOUT NOTIFICATION AND AUTHORISATION FROM THE DEPARTMENTAL REPRESENTATIVE. THE DEPARTMENTAL REPRESENTATIVE WILL ADVISE THE (FPO) OF THE DETAILS OF ANY SUCH EVENT.

.4 DO NOT USE FIRE HYDRANTS, STANDPIPES AND HOSE SYSTEMS FOR OTHER THAN FIRE FIGHTING PURPOSES UNLESS AUTHORISED BY DEPARTMENTAL REPRESENTATIVE.

.6 Fire Extinguishers

.1 Provide a minimum of 1-20 lb. ABC Dry Chemical Fire Extinguisher at each hot work or open flame location.

.2 Provide fire extinguishers for hot asphalt and roofing operations as follows:

a. Kettle area - 1-20 lb. ABC Dry Chemical;
b. Roof - 1-20 lb. ABC Dry Chemical at each open flame location.

.3 Provide fire extinguishers equipped as below:

c. Pinned and sealed;
d. With a pressure gauge;
e. With an extinguisher tag signed by a fire extinguisher servicing company.

.4 Carbon Dioxide (C02) extinguishers will not be considered as substitutes for the above.

.7 Roofing Operations

.1 Kettles:

.1 Arrange for the location of asphalt kettles and material storage with the Departmental Representative before moving on site. Do not locate kettles on any roof or structure and keep them at least 10m (30 feet) away from a building.

.2 Equip kettles with 2 thermometers or gauges in good working order; a hand held and a kettle-mounted model.

.3 Do not operate kettles at temperatures in excess of 232°C (450 °F).

.4 Maintain continuous supervision while kettles are in operation and provide metal covers for the kettles to smother any flames in case of fire. Provide fire extinguishers as required in article 2.6.

.5 Demonstrate container capacities to Departmental Representative prior to start of work.

.6 Store materials a minimum of 6m (20 feet) from the kettle.

.2 Mops:

.1 Use only glass fibre roofing mops.

.2 Remove used mops from the roof site at the end of each working day.

.3 Torch Applied Systems:

.1 DO NOT USE TORCHES NEXT TO WALLS.

.2 DO NOT TORCH MEMBRANES TO EXPOSED WOOD OR CAVITY

.3 Provide a Fire Watch as required by article 2.9 of this section.

.4 Store all combustible roofing materials at least 3m (10 feet) away from any structure.

.5 Keep compressed gas cylinders a minimum of 6m (20 feet) away from the kettle, protected from mechanical damage and secured in an upright position.

.8 Welding / Grinding Operations

.1 Contractor to provide fire blankets, portable fume extraction devices, screens or similar equipment to prevent exposure to welding flash, or sparks from grinding.

.9 **Fire Watch**

.1 Provide a fire watch for a minimum of one hour after the termination of any hot work operation.

.2 For temporary heating, refer to General Instructions Section 00 010 00.

.3 Equip fire watch personnel with fire extinguishers as required by article 2.6.

.10 Obstruction of access/egress routes-roadways, halls, doors, or elevators

.1 Advise the Departmental Representative in advance of any work that would impede the response of Fire Department personnel and their apparatus. This includes violation of minimum overhead clearance, erection of barricades and the digging of trenches.

.2 Building exit routes must not be obstructed in any way without special permission from the Departmental Representative, who will ensure that adequate alternative routes are maintained.

.3 The Departmental Representative will advise the FPO of any obstruction that may warrant advanced planning and communication to ensure the safety of building occupants and the effectiveness of the Fire Department.

.11 Rubbish and Waste Materials

.1 Keep rubbish and waste materials to a minimum and a minimum distance of 6m (20 feet) from any kettle or torches.

.2 Do not burn rubbish on site.

.3 Rubbish Containers

.1 Consult with the Departmental Representative to determine an acceptable safe location for any containers and the arrangement of chutes etc. prior to bringing the containers on site.

.2 Do not overfill the containers and keep area around the perimeter free and clear of any debris.

.4 Storage

.1 Exercise extreme care when storing combustible waste materials in work areas. Ensure maximum possible cleanliness, ventilation and that all safety standards are adhered to when storing any combustible materials.

.2 Deposit greasy or oily rags or materials subject to spontaneous combustion in CSA or ULC approved receptacles and remove at the end of the work day or shift, or as directed.

.12 Flammable Liquids

.1 The handling, storage and use of flammable liquids is governed by the current National Fire Code of Canada.

.2 Flammable Liquids such as gasoline, kerosene and naphtha may be kept for ready use in quantities not exceeding 45 litres (10 imp gal), provided they are stored in approved safety cans bearing the ULC seal of approval and kept away from buildings, stockpiled combustible materials etc. Storage of quantities of

flammable liquids exceeding 45 litres (10 imp gal) for work purposes, require the permission of the Departmental Representative.

.3 Flammable liquids are not to be left on any roof areas after normal working hours.

.4 Transfer of flammable liquids is prohibited within buildings.

.5 Do not transfer flammable liquids in the vicinity of open flames or any type of heat producing device.

.6 Do not use flammable liquids having a flash point below 38 ºC (100 ºF) such as naphtha or gasoline as solvents or cleaning agents.

.7 Store flammable waste liquids for disposal in approved container located in a safe, ventilated area. Waste flammable liquids are to be removed from the site on a regular basis.

.8 Where flammable liquids, such as lacquers or urethane are used, ensure proper ventilation and eliminate all sources of ignition. Inform the Departmental Representative prior to, and at the cessation of such work.

3. Questions and/or clarifications

.1 Direct any questions or clarification on Fire or General Safety, in addition to the above requirements, to the Departmental Representative.

END OF SECTION

Part 1 GENERAL

1.1 Scope of Work

.1 The General Contractor is responsible for providing all scaffolding required on this project, both for himself and for all sub-trades. The contract for scaffolding must be carried directly by the General Contractor.

.2 Scaffolding shall be of type which is suitable for all sub-trades to meet their work requirements.

.3 Provide full aluminum platforms at all levels of scaffolding from 6'-0" upwards.

.4 Scaffolding shall not be removed until all inspections have been carried out and deficiencies completed to the satisfaction of the Departmental Representative.

.5 Provide a minimum of one stairwell scaffolds to marry at the same elevations as the platforms. There is to be no change in elevation in order to provide smooth flow to stairwells.

.6 Provide outriggers at each level c/w aluminum platforms.

.7 Provide handrails and toe boards at each platformed level.

.8 Provide all anchoring and stabilizers required to secure the scaffolding.

.9 Provide covered entries to permit safe access to the building.

.10 Provide scaffold locks at each level of scaffolding.

.11 Provide beams, pads, extension bars, etc. at all door openings, canopies, etc. to suit the conditions for the new work to progress.

.12 Provide all protections as noted.

.13 Unless otherwise approved by the Departmental Representative, to suit the site conditions, all scaffolding is to be completely erected within two weeks of award of contract.

Part 2 PRODUCTS

.1 N/A

Part 3 EXECUTION

3.1 Regulations

.1 Comply with all Canadian Labour and Safety codes.

.2 Comply with the Occupational Health & Safety Act and Regulations for construction projects from the Ontario Ministry of Labour, sections 76 to 87 in the erection of said equipment sections 58 to 59 guardrails and sections 64 to 67 temporary stairs.

3.2 Erectors

.1 The General Contractor will contract with a qualified scaffold erection company, specializing in this field. All the equipment is to be supplied from the one source to ensure compatibility.

.2 Obtain the Departmental Representative's approval prior to proceeding

3.3 Inspection

.1 Provide scaffold approval through the Ontario Ministry of Labour to ensure compliance and provide documentation to the Engineer of said compliance.

.2 Ensure that the scaffolding is maintained in top condition on an on-going basis.

.3 Provide daily, weekly or as required by the Departmental Representative, inspection reports on the scaffolding to ensure that it is being maintained.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 07 52 00 – Modified Bituminous Membrane Roofing.

.2 Section 07 62 00 – Sheet Metal Flashing and Trim.

.3 Section 07 92 00 – Joint Sealants.

.4 Section 22 05 11 – Plumbing and Drainage.

1.2 REFERENCES

.1 ASTM International

.1 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 CSA International

.1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.

.2 CSA O141-05 (R2009), Softwood Lumber.

.3 CSA O151-09, Canadian Softwood Plywood.

.3 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2010.

.4 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S702-14, Standard for Mineral Fibre Thermal Insulation for Buildings.

.2 CAN/ULC-S702.2-10, Standard for Mineral Fibre Thermal Insulation for Buildings, Part 2: Application.

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 NRC 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 0151.

.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 Wood to steel deck fasteners: Screws to be factory coated with an additional corrosion protection.

.1 Standard of acceptance:

.1 Climaseal.

.2 Or accepted alternate.

.3 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.

.1 Standard of acceptance:

.1 Tapcon.

.2 Or accepted alternate.

.4 Expansion fasteners for wood plates and steel to concrete deck: AISI Type 304 stainless steel, with stainless nuts and washers.

.1 Standard of acceptance:

.1 Hilti Kwik Bolt TZ.

.2 Or accepted alternate.

.5 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 NRC Departmental Representative.

.1 Standard of acceptance:

.1 Atlas Bolt.

.2 Rawl.

.3 Or accepted alternate.

.6 Nails, spikes and staples: To CSA B111.

2.4 ACCESSORIES

.1 Interior gypsum board Type X: To ASTM C1396/1396M-13, thickness 12.7 mm unless otherwise noted.

2.5 FINISHES

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

.2 Interior paint for drywall at hatch: 2 coats interior acrylic latex, colour to match existing, eggshell.

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 casework, cabinets, 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.

.8 Install wood backing, dressed, tapered and recessed slightly below top surface of roof insulation for roof hopper.

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 Secure wood to metal deck in a staggered pattern with each row spaced at 450 mm c/c with specified fasteners at minimum 450 mm c/c. Secure bottom nailer with minimum two rows of No. 10, galvanized steel screws at maximum spacing of 600 mm. Screws shall be of sufficient length to penetrate top flute of decking a minimum 13 mm and a maximum of 19 mm.

.5 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.

.6 Unless specified otherwise, the number of fasteners shall be doubled at all outside parapet corners, for a distance of 3 m from the corner.

.7 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 Gypsum board:

.1 Install sheathing to curbs, as indicated on the drawings and details. Secure with specified fasteners at 200 mm c/c around perimeter of each board and at maximum 200 mm c/c spacing in the field of the board.

.2 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 GENERAL SCOPE

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

.2 The new roof system shall be as follows and as specified in the areas indicated on the drawings:

- .1 Existing steel deck with concrete fill.
- .2 Air/vapour barrier.
- .3 Combination of a min. 75 mm rigid polyiso insulation and sloped polyiso insulation as indicated on the drawings.
- .4 50mm Torchable dual density insulation with integrated cover board protection.
- .5 2-ply modified bituminous membrane.

.3 Temporary overhead protection will be required above all entrances directly below the contract areas. Protection shall consist of standard steel scaffolding with prefabricated plywood and steel roof covers and shall be a minimum of 2.0m wide by 2.4m unrestricted clear height.

.4 Access to roofs shall be by ladder. The ladder shall be removed and locked at the end of each work period.

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.

.4 Section 22 05 11 – Plumbing and Drainage.

.5 Canadian Standards Association (CSA International)

- .1 CSA A123.22-08(r2013), Self-Adhering Polymer Modified Bituminous Membrane Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- .2 CSA A123.23-15 - Product specification for polymer-modified bitumen sheet, prefabricated and reinforced.
- .3 CSA B149.1-10 (R2015), Natural Gas and Propane Installation Code

.6 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-1.108-M89, Bituminous Solvent Type Paint.
- .2 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.

.7 Underwriters Laboratories' of Canada (ULC)

.1 CAN/ULC-S107-10, Standard Methods of Fire Tests of Roof Coverings.

.2 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.3 CAN/ULC-S702.2-03, Standard for Mineral Fibre Thermal Insulation for Buildings.

.4 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

.5 CAN/ULC-S770-09, Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Convene pre-installation meeting one week prior to beginning roofing Work, with roofing contractor's representative and NRC 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.

1.4 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.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 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 Safety Data Sheets to NRC Departmental Representative for:

.1 Primers.

.2 Sealers.

.3 Liquid membrane.

.4 Adhesives.

.2 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.

.3 Provide shop drawings for suspended walkway at roof top unit. Drawings shall be stamped by a structural engineer, licensed in Ontario. Drawings shall indicate all required railings, stairs, platforms, bases, connections and attachments.

1.6 QUALITY ASSURANCE

.1 Installer qualifications: Company or person specializing in application of modified bituminous roofing systems with 5 years documented experience, approved by manufacturer.

.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 NRC Departmental Representative, to review installation conditions particular to this project.

1.7 FIELD QUALITY CONTROL

.1 Water Testing:

.1 In the event the NRC 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 NRC Departmental Representative's operations personnel.

.2 Contractor is to assume all costs of testing and correction.

.2 Adhesion Testing:

.1 If requested by the NRC 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 NRC Departmental Representative. Provide labour and materials as required to assist NRC 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 NRC 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 NRC 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 NRC 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 NRC 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.

1.8 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 1 hours after each day's torching operations cease.

1.9 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 NRC 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 NRC Departmental Representative of adjustments to specified roofing procedures caused by weather and site conditions. Make adjustment to specified procedures only after review with the NRC 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 NRC Departmental Representative.

.8 Do not penetrate roof deck with any fastening devices that would do damage or impair the function of the assembly.

.9 All temporary drains shall be connected with a mechanical connection (MJ coupling) or a U-flow connection, until new drains are installed.

1.10 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) 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.

1.11 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 NRC 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.

1.12 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 NRC 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.

1.13 EXISTING SUBSTRATES

.1 Following removal of existing material to the substrate, inspect the deck for soundness and notify the NRC Departmental Representative of any deck found unsound and not suitable for roofing. Do not commence work until conditions are documented and the NRC 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 NRC 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.

1.14 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.

1.15 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 NRC Departmental Representative/NRC Departmental Representative in writing of any defects.

1.16 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 Ensure plumbing is accessible and work can be completed as specified.

.4 Inspect roof drains to ensure they are open and working properly.

.5 Where specified or shown for areas with only one drain, provide overflow scuppers or drains to detail and specified requirements.

1.17 HIDDEN SERVICES

.1 Investigate the location of all known hidden services by reviewing interior conditions, plans, specifications and drawings for the original building, any subsequent alterations, completion of cut tests and interviewing those involved in the construction and maintenance of building services. These services include but are not limited to mechanical, electrical, cable, communication, computer, security or roof assembly. Ensure all services are located and will be protected from damage under the Contract. In some cases, services may be located over the roof deck and within the roof assembly. Notify NRC Departmental Representative/NRC Departmental Representative in such occurrence and proceed with installation as directed.

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 NRC Departmental Representative.

.2 During re-roofing, ensure that all mechanical equipment, ducts, pipes, etc. are properly supported.

.3 Notify NRC Departmental Representative and/or NRC Departmental Representative of any equipment which is not operational or damaged prior to the commencement of work.

1.19 ADVISE NRC Departmental Representative

.1 Advise the NRC Departmental Representative of any unusual circumstances affecting the work. Notify the NRC 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 NRC 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 NRC 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 NRC 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 NRC 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 NRC 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 NRC Departmental Representative on site.

2.3 AIR/VAPOUR BARRIER MEMBRANE

.1 For concrete decks:

.1 Torch grade modified bituminous air/vapour barrier, with polyester or glass fleece reinforcement, minimum thickness 3 mm, top side sanded, having nominal weight of 180 g/m².

.1 Type 2.

.2 Class C - plain surfaced.

.3 Grade 1 - standard service.

.4 Top and bottom surfaces: sanded/polyethylene.

2.4 SELF-ADHERED MEMBRANE

.1 To CSA A123.22, self-adhering membrane consisting of SBS rubberized asphalt compound laminated to a polyethelene film. Minimum thickness 1 mm.

.1 Standard of acceptance:

.1 Blueskin SA by Henry Bakor.

.2 GoldShield by IKO.

.3 Soprastick 1100 by Soprema.

.4 Vapour Barrier SA by Johns Manville.

.5 Or accepted alternate.

2.5 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 Self-adhesive base sheet membrane flashing (combustible substrates): To CSA A123.23.

.1 Styrene-butadiene-styrene (SBS) elastomeric polymer prefabricated sheet, polyester or composite polyester and glass reinforcement.

.2 Type B or Type C.

.3 Grade 2.

.4 Top and bottom surfaces:

.1 Polyethylene/release paper.

.4 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.

.5 Fireguard tape:

.1 Modified bituminous membrane supplied in strips, 150 mm wide, 1.6 mm thick, glass fleece reinforced with self-adhesive underside.

.2 Provided by membrane manufacturer.

2.6 LIQUID MEMBRANE

.1 Two-component methacrylate or one component polyurethane/bitumen resin, solid content 80% or greater, compatible with roof membrane.

.1 Standard of acceptance:

.1 Alsan Flashing by Soprema.

.2 MS Detail by IKO.

.3 PermaFlash by Johns Manville.

.4 Or accepted alternate.

.2 Reinforcement mesh: As recommended by liquid membrane manufacturer.

2.7 ADHESIVES

.1 Adhesive for securing overlay board and insulation: To be fully compatible with all materials in the roofing assembly. Applicability of use to adhere the different materials in the roofing assembly to be included in the manufacturer's literature.

.1 Standard of acceptance:

.1 Thermostik 880-33 by Henry Bakor.

.2 Duotack by Soprema.

.3 Millenium by IKO.

.4 Fas-n-free by Tremco.

.5 Insta-Stick by Instafoam Inc.

.6 Roof Assembly Adhesive by Chemlink.

.7 Olybond 500 by OMG.

.8 2-Part UIA by Johns Manville.

.9 Or accepted alternate.

2.8 ADHESIVES FOR MEMBRANE APPLICATION

.1 Adhesive for securing Membranes: To be fully compatible with all materials in the roofing assembly. Applicability of use to adhere the different materials in the roofing assembly to be included in the manufacturer's literature.

.1 Standard of acceptance or approved equivalent:

.1 Coldply Trowel Grade by Soprema

.2 Cold Gold by IKO

.3 Powerply Adhesive by Tremco

.4 As specifically recommended by membrane manufacturer.

2.9 POLYISOCYANURATE INSULATION (INORGANIC)

.1 Conforming to CAN/ULC S704, rigid foam board, Class 2 or 3, Type 3. Manufactured with HC blowing agent meeting requirements of CAN/ULC S-126, CAN/ULC S107 and CAN/ULC S770 for LTTR values. Approved and listed by Factory Mutual Global for 1-60 and 1-90 wind classification and FM 4450 requirements for Class 1 fire. Thickness as specified or shown with maximum board size 1200 mm x 1200 mm. Fibre-reinforced **inorganic facers** on both major surfaces of the core foam.

2.10 SLOPED INSULATION (INORGANIC)

.1 Conforming to CAN/ULC S704, rigid foam board, Class 2 or 3, Type 3. Manufactured with HC blowing agent meeting requirements of CAN/ULC S-126, CAN/ULC S107 and CAN/ULC S770 for LTTR values. Approved and listed by Factory Mutual Global for 1-60 and 1-90 wind classification and FM 4450 requirements for Class 1 fire. Thickness as specified or shown with maximum board size 1200 mm x 1200 mm. Fibre-reinforced **inorganic facers** on both major surfaces of the core foam.

.2 Insulation slopes shall be as indicated on the detailed drawings and roof plans. Modules shall be factory cut to correct slopes.

.3 Sloped insulation must terminate at 0 thickness. Supply an additional nosing piece if required, factory fabricated of compatible, flame-resistant sloped rigid insulation material, to smoothly terminate sloped insulation at 0 thickness.

2.11 RIGID INSULATION (MINERAL WOOL)

.1 Rigid, dual-density, dimensionally stable, mineral wool insulation board, FM 4470 for Class A fire. Thickness shall be 50mm as shown on Drawings with a maximum board size of 1200 mm x 666 mm.

.1 Intended for use with hot mop, torch applied or cold applied adhesive roofing membrane systems.

.2 a rigid dual density rock wool insulation board with top surface coated with bitumen for a torching application.

.3 Standard of acceptance:

.1 Rockwool Toprock DD Plus, as manufactured by Rockwool Ltd

2.12 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.

2.13 WALKWAY MATERIALS

.1 One additional ply of cap sheet membrane. Colour to be different from field membrane as selected by NRC Departmental Representative.

2.14 MEMBRANE FASTENING BAR

.1 Galvanized sheet steel or extruded aluminum, thickness 1 mm (20 ga.), 38 mm width, supplied in minimum 2.4 m lengths, with pre-drilled 2 mm holes, secured with #14 stainless steel screws @ 150 mm c/c.

2.15 FASTENERS

.1 Fasteners for exposed metal flashing and cladding to wood or steel: Minimum 38 mm #10 cadmium plated hex head screws, colour matched, with neoprene and steel washers.

.2 Fasteners for plywood or sheet metal to concrete deck: Corrosion resistant purpose-made pre-drill, self-tapping concrete screws, minimum 4.78 mm diameter, minimum 25 mm penetration into concrete.

.1 Standard of acceptance:

.1 Tapcon.

.2 Or accepted alternate.

.3 Fasteners for sheet metal into steel: Self-drilling, self-tapping screws, galvanized, #8 or larger size, Teks or equivalent, head to suit application.

.4 Fasteners for sheet metal and wood to wood: Corrosion resistant #10 wood screws or nails to suit application.

.5 Structural fasteners into wood: Lag screws, 12.7 mm diameter hot dipped galvanized steel, length 125 mm.

.6 Expansion fasteners for wood plates and steel to concrete deck: AISI Type 304 stainless steel, with stainless nuts and washers.

.1 Standard of acceptance:

.1 Hilti Kwik Bolt TZ.

.2 Or accepted alternate.

2.16 PLUMBING VENTS

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

.1 Standard of acceptance:

.1 Flash-tite by Lexcor, EVF-1 by Thaler.

.2 Or accepted alternate.

2.17 ROOF DRAINS

.1 See Section 22 05 11 – Plumbing and Drainage.

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 NRC Departmental Representative and manufacturer immediately and request direction.

3.2 REMOVAL OF EXISTING ROOFING

.1 Remove all roofing, flashing and insulation materials down to existing vapour barrier.

.1 With hand tools only, nothing that vibrates, cannot disturb steel fireproofing in ceiling plenum below, as it contains asbestos.

.2 Leave existing blocking and parapet construction in place where indicated

.3 Where new overlay system is specified, pressure wash to remove all algae, loose granules and other deleterious substances.

3.3 EXAMINATION OF SUBSTRATE

.1 Verification of Conditions:

.1 Inspect with NRC Departmental Representative 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 MECHANICAL EQUIPMENT DISCONNECTION / MODIFICATION / RECONNECTION

.1 Perform disconnection, extension, modification, and reconnection of mechanical equipment in accordance with drawings provided. Work shall be performed by a licensed trade sub-contractor. Obtain approval from NRC Departmental Representative prior to making adjustments not scheduled.

.2 In general, Contractor is responsible for disconnection extension, modification, and reconnection of all operating HVAC equipment in work area. NRC Departmental Representative is responsible for disconnection (at interior) of those mechanical items indicated for removal by Contractor.

.3 All mechanical equipment must be properly tagged out of service (especially where gas is present). ESA certificates are required for all mechanical and electrical reconnections.

3.5 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 NRC 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.

3.6 PRIMING

.1 Unless otherwise indicated or directed by NRC Departmental Representative, prime all surfaces which will be in direct contact with bituminous materials at the rate of 0.15 L/m^2 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.

3.7 TORCH-APPLIED AIR/VAPOUR BARRIER ON CONCRETE DECK

.1 Ensure all surfaces to be covered with self-adhering membrane are complete and free of moisture and contaminants and surfaces are above 5°C (40°F). At temperatures below 5°C (40°F) heat materials to be covered with hot air gun. Store all materials in heated storage when temperatures fall below 5°C (40°F) and remove only as much material that can be used before cooling.

.2 Prime all vertical surfaces to be covered with torch-applied membrane, and horizontal surfaces as required. Use roller application – no spray application permitted. Let primer tack dry and complete thumb test to test set-up.

.3 Use fireguard tape or overlay board to protect all open joints in substrate and all combustible surfaces.

.4 Working up slope from drain, install air/vapour barrier membrane using torch methods, true to line to completely cover the area intended to be protected to points shown on the drawing.

.5 Membrane is to be installed without air blisters and wrinkles. Rework, repair or replace all poorly installed membrane. Do not stretch material that would result in pullback and deformity of the membrane at intersections.

.6 Lap all side laps 75 mm and end laps 150 mm. Torch all seams to achieve bleedout. At nailable surfaces, secure all membrane on vertical surface at points of termination at 150 mm c/c, using large head roofing nails.

.7 Turn up membrane 150 mm at edge where horizontal surface meets vertical planes. Lap onto existing surfaces as required to provide continuity of air/vapour barrier at terminations. Use fireguard tape or overlay board to protect all open joints in deck and all combustible surfaces

.8 Seal all points of termination at horizontal planes and vertical surfaces with modified sealant. Tool sealant to consistent smooth and even surface.

.9 Seal all perimeters and penetrations, and ensure drains are operational and prevent backflow, if air/vapour barrier is to be left exposed as an overnight temporary waterproofing.

3.8 INSULATION – ALL LAYERS – ADHESIVE ADHERED

.1 Attach insulation as per the OBC Wind Uplift Attachment detail illustrated on the drawings.

.2 Install base insulation layer over air/vapour barrier to specified design intent and thickness. Secure insulation laid with adhesive, in pattern as per adhesive manufacturer’s directions and as indicated. Apply boards before adhesive cures, skims over or loses adhesive qualities.

.3 For subsequent layers of insulation, secure insulation laid with adhesive, in pattern as per adhesive manufacturer’s recommendations and as indicated.

.4 Stagger all joints of insulation a minimum 300 mm.

.5 Stagger both end and side joints between insulation layers.

.6 Butt sheets of insulation with moderate contact. Do not force insulation into place. Cut neatly at projections and points of termination. Replace all broken, damaged or misfit boards as work progresses.

.7 Where necessary, back-cut insulation to allow it to conform and stay bonded to irregular surfaces without bridging. Subsequent to placement, walk insulation into place to ensure positive bonding is achieved.

3.9 SLOPED INSULATION

.1 Attach boards as per the OBC Wind Uplift Attachment detail illustrated on the drawings.

.2 At all locations of sloped insulation provide shop drawings from sloped insulation manufacturer for NRC Departmental Representative's review prior to installation.

.3 At all new and existing drain locations, provide sloped polyisocyanurate insulation sump around drain to promote positive drainage. Total sump size to be as shown on drawings, with maximum depression of 25 mm, unless otherwise indicated.

.4 Installation methods for sloped insulation to be same as for upper layers of base insulation, using adhesive as specified.

3.10 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 NRC 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 NRC 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.

3.11 BASE SHEET FLASHINGS (SELF-ADHERED 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 Ensure wall or eave surfaces are clean and dry, free of contaminants or other irregularities. Re-prime as necessary.

.4 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.

.5 Place sheet into primer or adhesive and press into place using hand roller to ensure uniform adhesion. Use hot air welder on all seams and joints to ensure a waterproof seal on all points of termination. Apply flashings free of air pockets, voids, wrinkles or fishmouths.

3.12 BASE SHEET (COLD ADHESIVE APPLICATION) AT WALL DETAIL

.1 All membranes within 1 m of wall detailing shall be applied by cold process.

.2 Install base sheet membrane into full application of specified adhesive using notched squeegee as per manufacturer's recommendations. Install adhesive at rate and pattern recommended by membrane manufacturer, in continuous application including underlapping side and end laps.

.3 Use broom or squeegee during membrane application to ensure complete bitumen embedment – free of wrinkles, air pockets or voids. Adhesive to flow continuously 7 mm beyond both sides of the roll.

.4 Carry base sheet membrane to extend 50 mm up vertical surface and terminate as shown on drawings.

.5 At terminations, on nailable vertical surfaces, extend membrane 50 mm up vertical surface and adhere to wall. Secure membrane at 225 mm c/c with nails or screws having 25 mm diameter caps.

.6 Ensure that a watertight seal of all joints and points of termination is achieved.

3.13 CAP SHEET (COLD ADHESIVE APPLICATION) AT WALL DETAIL

.1 All cap sheet applications within 1.0m of wall shall be a cold process application.

.2 Install cap sheet membrane into full application of specified adhesive using notched squeegee as per manufacturer's recommendations. Install adhesive at rate not less than 0.7 L/m² in continuous application including underlapping side and end laps.

.3 Use broom or squeegee during membrane application to ensure complete bitumen embedment – free of wrinkles, air pockets or voids. Adhesive to flow continuously 7 mm beyond both sides of the roll. Immediately provide granules to cover adhesive flow at side and end laps.

.4 Ensure that a watertight seal of all joints and points of termination is achieved.

3.14 CAP SHEET FLASHINGS (COLD ADHESIVE APPLICATION) AT WALL DETAIL

.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 pieces 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 to 50 mm higher than base sheet flashings.

.4 Place sheet in adhesive and press into place to ensure uniform adhesion and 13 mm bitumen flow each side of the roll. Apply flashings free of air pockets, voids, wrinkles or fishmouths.

.5 Take care to avoid excessive adhesive spillage on finished roof surface. Use a hot air welder where required for touch-ups or detail work in corner locations or as necessary.

3.15 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 NRC 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.

3.16 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 NRC Departmental Representative and obtain his approval for proposed repair methods. Questionable areas will require to be cut out and replaced.

3.17 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 NRC 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.

3.18 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 NRC 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.

3.19 DRIP FLASHINGS

.1 Follow manufacturer's recommendations as to whether pre-finished flashings built into the roof are to be primed. When primer is required, prime top and underside of all drip flashings to be incorporated with roofing prior to application. Primer must be compatible with both membrane and finishes on pre-finished flashing material. Use primer supplied by the membrane manufacturer. All primer to be dry before proceeding.

.2 Fabricate and install metal drip flashings built into the roof at locations noted on the drawings as per detail and Section 07 62 00 - Sheet Metal Flashing and Trim. Join flashing with S-lock on face and overlap horizontal joints 50 mm. Mitre and seal inside and outside corners of roof flanges. Seal all overlaps, apply sealant Type 'B' as metal flashing is being installed and clean off any material exposed to view. Avoid contact between caulking and bitumen products.

.3 Install drip flashing true to line set on top of completed base sheet membrane roofing in continuous strip of Type 'A' sealant. Secure flashings with roofing nails installed in a double staggered row at 100 mm centres. Locate nails no closer than 75 mm from face.

.4 Install an additional piece of base sheet (minimum 150 mm X 150 mm) centered over joints and corners of drip flashing and carried to within 25 mm of edge. Review procedures with the NRC Departmental Representative before proceeding.

.5 Install 1-ply of base to 25 mm from drip edge and continuing a minimum of 150 mm beyond flashing flange. Ensure positive bond to all metal as to provide a continuous permanent watertight seal.

.6 Install cap sheet as specified and trim flush with outside face with hot roofing knife. Work underlying surfaces with broom, roller or wet sponge as required to obtain a positive continuous permanent watertight seal.

3.20 ROOF DRAINS

.1 See Section 22 05 11 – Plumbing and Drainage for plumbing work.

.2 Install self-adhered membrane air seal around drain and extend onto air/vapour barrier minimum 150 mm.

.3 Unless otherwise specified or shown, provide prefabricated sump of sloped polyisocyanurate insulation 1200 mm each side of the centre of the drain. Reduce polyisocyanurate insulation thickness to minimum 19 mm at drain to provide positive

roof drainage (make allowance for thickness of all flanges and clamps) and ensure water flow will not be impeded.

.4 Complete roof membrane, installing additional 1 m x 1 m base sheet flashing centred over drain opening.

.5 Fully coat drain flange to receive roofing with modified sealant and continue modified bitumen over flange. Neatly trim and work membrane to interior face and seal with Type 'A' sealant.

.6 Set clamping ring in solid bed of Type 'A' sealant. Secure clamp ring and integral screen as dictated by drain design immediately after membrane is installed. Tighten bolts to ensure a permanent watertight compression seal.

.7 Install and bolt strainers with heavy iron mechanical bracket to ensure the drain screen remains permanently in place to the NRC Departmental Representative's approval.

.8 Install test plug, water test roof and repair leaks. Remove test plug once complete.

.9 Restore interior finishes affected by work of this Contract to match original materials and finishes to NRC Departmental Representative's approval. Insulate rainwater leader pipes as required by Summary of Work in accordance with Section 22 05 11 – Plumbing and Drainage.

3.21 PLUMBING VENTS, B-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.

.11 Install rain collars over sleeves and stacks as indicated to match adjoining materials and seal with sealant as indicated on drawings.

3.22 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.

3.23 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 NRC 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 52 00 – Modified Bituminous Membrane Roofing.

.3 Section 07 92 00 – Joint Sealants.

1.2 REFERENCE STANDARDS

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM D523-14, Standard Test Method for Specular Gloss.

.2 Canadian Standards Association (CSA International)

.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.3 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual 2012.

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

.1 Material Safety Data Sheets (MSDS).

.5 Sheet Metal and Air Conditioning Contractors Association of North America (SMACNA)

.1 Architectural Sheet Metal Manual – 2012.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit to the NRC Departmental Representative a list of materials intended for use before they are ordered.

.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 MSDS - Material Safety Data Sheets.

.2 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 NRC 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 NRC 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) 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 (22 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 ACCESSORIES

.1 Metal cleat: Same material as metal flashings, 50 mm wide @ 600 mm c/c.

.2 Continuous metal starter strip: 0.71 mm (21 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: Tapcon, Permagrip or Tapgrip or Rawl. 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 NRC Departmental Representative.

.7 Screws for starter strips and fascia: #8 @ 400 mm c/c.

.8 Sealant: Refer to Drawings and Section 07 92 00 – Joint Sealants.

.9 Touch-up paint: As recommended by prefinished material manufacturer.

2.4 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/m^2.

.5 Install sheet metal with concealed fasteners at lock joints. Exposed fastening will only be permitted with the approval of the NRC 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 NRC 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.

3.3 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 07 52 00 – Modified Bituminous Membrane Roofing.

.2 Section 07 62 00 – Sheet Metal Flashing and Trim.

.3 Section 07 92 00 – Joint Sealants.

.4 Section 22 05 11 – Plumbing and Drainage.

1.2 REFERENCES

.1 ASTM International

.1 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 CSA International

.1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.

.2 CSA O141-05 (R2009), Softwood Lumber.

.3 CSA O151-09, Canadian Softwood Plywood.

.3 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2010.

.4 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S702-14, Standard for Mineral Fibre Thermal Insulation for Buildings.

.2 CAN/ULC-S702.2-10, Standard for Mineral Fibre Thermal Insulation for Buildings, Part 2: Application.

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 NRC 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 0151.

.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 Wood to steel deck fasteners: Screws to be factory coated with an additional corrosion protection.

.1 Standard of acceptance:

.1 Climaseal.

.2 Or accepted alternate.

.3 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.

.1 Standard of acceptance:

.1 Tapcon.

.2 Or accepted alternate.

.4 Expansion fasteners for wood plates and steel to concrete deck: AISI Type 304 stainless steel, with stainless nuts and washers.

.1 Standard of acceptance:

.1 Hilti Kwik Bolt TZ.

.2 Or accepted alternate.

.5 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 NRC Departmental Representative.

.1 Standard of acceptance:

.1 Atlas Bolt.

.2 Rawl.

.3 Or accepted alternate.

.6 Nails, spikes and staples: To CSA B111.

2.4 ACCESSORIES

.1 Interior gypsum board Type X: To ASTM C1396/1396M-13, thickness 12.7 mm unless otherwise noted.

2.5 FINISHES

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

.2 Interior paint for drywall at hatch: 2 coats interior acrylic latex, colour to match existing, eggshell.

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 casework, cabinets, 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.

.8 Install wood backing, dressed, tapered and recessed slightly below top surface of roof insulation for roof hopper.

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 Secure wood to metal deck in a staggered pattern with each row spaced at 450 mm c/c with specified fasteners at minimum 450 mm c/c. Secure bottom nailer with minimum two rows of No. 10, galvanized steel screws at maximum spacing of 600 mm. Screws shall be of sufficient length to penetrate top flute of decking a minimum 13 mm and a maximum of 19 mm.

.5 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.

.6 Unless specified otherwise, the number of fasteners shall be doubled at all outside parapet corners, for a distance of 3 m from the corner.

.7 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 Gypsum board:

.1 Install sheathing to curbs, as indicated on the drawings and details. Secure with specified fasteners at 200 mm c/c around perimeter of each board and at maximum 200 mm c/c spacing in the field of the board.

.2 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 06 10 53 – Miscellaneous Rough Carpentry.

.2 Section 07 52 00 - Modified Bituminous Membrane Roofing.

.3 Section 07 92 00 – Joint Sealants.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C547-12. Standard Specification for Mineral Fiber Pipe Insulation.

.2 American Water Works Association (AWWA).

.1 ANSI/AWWA C110/A21.10-08, American National Standard for Ductile-Iron and Gray-Iron Fittings for Water.

.2 ANSI/AWWA C111/A21.11-12, Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.3 Cast Iron Soil Pipe Institute (CISPI)

.1 CISPI 310-12, Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.

.4 Canadian Standards Association (CSA International)

.1 CAN/CSA B70.1-03 (R2013), Frames and Covers for Maintenance Holes and Catchbasins.

.2 CAN/CSA-B70-12, Cast Iron Soil Pipe, Fittings, and Means of Joining.

.3 CSA B79-08 (R2013), Commercial and residential drains and cleanouts.

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

.1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTAL / APPROVAL

.1 Do not commence work until satisfactory installation of related work has been completed and approved.

.2 Inspect work and advise NRC 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 accepted responsibility for appearance and performance of completed work.

.4 Defective work resulting from work on unsatisfactory surfaces will be considered the responsibility of those performing the work of this Section.

.5 Repair damage and inferior work caused by the work of this Contract with materials and finish to match the original to NRC Departmental Representative’s approval.

.6 Submit to the NRC Departmental Representative a list of materials intended for use before they are ordered.

.7 Provide samples of material without additional cost, to the NRC Departmental Representative for review as requested.

1.4 QUALITY ASSURANCE

.1 All drain installations, including insert type drains, shall be completed by plumbing subtrades licensed to undertake plumbing work in Ontario.

.2 Equipment and materials must be new and free of imperfections.

Part 2 Products

2.1 MATERIALS

.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.

.3 Copper roof drains: Soldered copper body with flat hub. Provide appropriate bearing pans, and hardware, as required.

.1 At existing or new drain locations: Size to match existing.

.1 Standard of acceptance:

.1 Model RD-24C-RR with vandal proof dome strainer by Thaler Metal Industries Inc.

.2 Or accepted alternate.

.2 Drain connector:

.1 Mechanical connection using double clamp to drain body and rainwater leader.

.2 Standard of acceptance:

.1 Fernco Couplings.

.2 Or accepted alternate.

.4 Fittings: Iron fittings for cast iron or ductile-iron water pipes shall conform to ANSI/AWWA C110/A21.10, 75 mm through 1200 mm, for water and other liquids.

Part 3 Execution

3.1 PREPARATION

.1 Inspect surfaces and ensure that:

.1 Roof deck is level or sloped to provide proper and complete drainage from the roofing system in conformity to design intent.

.2 Plumbing is accessible and work can be completed as specified. Notify NRC Departmental Representative of any adverse conditions.

.3 Existing roof drains are open and functioning properly.

.4 For costing and practical purposes, location of new drains and plumbing are approximate and should be considered accurate within 3 m. Advise NRC

Departmental Representative of variances and adjust locations as required to facilitate installation without additional cost, to the NRC Departmental Representative's approval.

.2 Contractor shall advise NRC Departmental Representative in the event that the existing system or materials do not meet current code requirements.

.3 Contractor to provide interior protection to all areas where plumbing work is being completed. Provide sufficient dust and debris protection for the temporary removal of ceiling tiles, and include for any supplemental clean up to return interiors to pre-construction conditions.

.4 Remove and discard all existing drains and plumbing not designated for re-use. Notify Owner of any hazardous materials encountered.

.5 In poured concrete decks, scan roof deck for presence of reinforcing steel or cast-in conduits, prior to coring.

3.2 INSTALLATION AT EXISTING DRAIN LOCATIONS

.1 Join pipe by means of EDPM super-seal gaskets.

.2 Fill voids around drain opening on concrete or lightweight concrete decks with quick dry concrete grout flush with top and bottom of deck.

.3 Restore all existing surfaces affected by work of this trade to match existing material and finish.

.4 Ensure each roof is provided with operational drainage at the end of each work day.

3.3 PLUMBING VENT MODIFICATIONS

.1 Cut down or extend existing soil stacks to a minimum height of 300 mm above finished roof surface. Extensions to match existing material and connections to be made with mechanical joint couplings.

3.4 PIPING TEST

.1 Install plumbing line plugs below the level of connection and water test new plumbing installation. Correct all leaks.

.2 Make leaks watertight while systems are still under test. If this is impossible, remove and refit defective parts. Caulking of threaded joints will not be permitted.

.3 After leaks have been repaired, repeat tests as often as necessary to obtain approval and to ensure watertightness of each system.

3.5 FINISH

.1 Reset existing ceiling finishes removed to execute work of this Contract.

.2 Restore and repair all existing surfaces affected by the work to match existing materials and finish.

.3 Re-paint entire ceiling or walls where it is required to make patching work un-disguisable with existing surfaces.

END OF SECTION

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National Research Council Canada
1200 Montreal Road, Building M-19, Room 340
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June 18, 2018

Attention: **Isabelle D'Amour-Tanguay, Project Manager**

RE: Project-Specific Designated Substances Survey
Exterior Cladding, Skylight and Fan Removal, and Roof Resurfacing Projects
Building M-58, 1200 Montreal Road, Ottawa, ON

DST File No.: GV-OT-031268

1.0 INTRODUCTION

DST Consulting Engineers Inc. (DST) was retained by the National Research Council (NRC) to conduct a Project-Specific Designated Substances Survey (DSS) for the Exterior Cladding, Skylight and Fan Removal, and Roof Resurfacing Projects located at Building M-58, at the NRC Campus, 1200 Montreal Road, in Ottawa, ON.

The Designated Substances Report is required under the Ontario Occupational Health and Safety Act in order to identify designated substances that may be present within the project area. The Canada Labour Code also stipulates under Part II, Section 124 that every employer shall ensure that the health and safety at work of every person employed by the employer is protected. By having a DSS conducted, NRC will be able to inform his or her employees, contractors, and tenants of any designated substances that may be present and possibly disturbed throughout the planned renovation work.

DST staff completed a visual inspection of building materials for the presence of suspected designated substances and select hazardous materials in the areas of Building M-58 that will be affected by the Exterior Cladding Project on November 29th, 2017. DST returned to site on February 1st, 2018 to assess the areas that will be affected by the Skylight and Fan Removal Project on March 22, 2018, May 17, and June 8, 2018 to sample roofing materials.

2.0 SCOPE OF WORK

The survey implemented by DST included the 11 designated substances listed in Section 30 of the Occupational Health and Safety Act, R.S.O. 1990, Chapter 0.1. Designated Substances, as identified under the Ontario Occupational Health and Safety Act, are as follows:

- Acrylonitrile;
- Arsenic;
- Asbestos-Containing Materials (ACMs) - both friable and non-friable;
- Benzene;
- Coke Oven Emissions;
- Ethylene Oxide;
- Isocyanates;
- Lead;
- Mercury;

- Silica; and
- Vinyl Chloride.

Other Hazardous Materials which are not classified as Designated Substances, but were included as part of the survey and considered pertinent due to applicable regulations, best practice guidelines and/or potential risks to human health and/or the environment, are:

- Polychlorinated Biphenyls (PCBs);
- Mould;
- Ozone-depleting substances; and
- Other hazardous materials, as deemed pertinent.

3.0 METHODOLOGY

The field program for this survey was completed by DST on November 29, 2017, February 1, 2018, March 22, 2018, May 17, and June 8, 2018. The survey was limited to areas of Building M-58 that may be affected by the projects.

The project areas are as follows:

Exterior Cladding Project:

- Areas of the exterior of the building with light textured cladding identified by an NRC Representative; and
- Cladding with large stone texture and pink texture were not to be included in the survey as per an NRC Representative.

Skylight and Fan Removal Project

- Two (2) skylights located on the roof of the facility and three (3) fans located on the roof of Block 1 of the facility. The roofing system was also assessed; and
- The ceiling, skylight portals, and plenum above the suspended ceiling in Office E12 (ceiling entry performed under Type 2 asbestos abatement precautions).

Roof Resurfacing Project

- Exterior roofs of Block 1, Block 5 and Block 8 (including roofing materials, caulkings, tar, etc.).

Specific sampling locations for the Exterior Cladding Project as well as locations of the skylights and fans to be removed were communicated to DST through drawings provided by the NRC Representative.

At the request of the NRC Representative, two (2) tests cuts per Block roof (eight (8) total) were also initially conducted by R & G Eastern Roofing (retained by DST). The roof was reinstated as part of the evaluation. While conducting test cuts in the middle section of the roof of Block 5, it was noted that water was present under the roofing material and therefore a base membrane material could not be sampled without causing risk for additional leakage. DST returned to site with R & G Eastern Roofing on June 8, 2016, in order to perform additional test cuts and roof sampling.

Materials suspected of containing designated substances were visually identified, based on the surveyor’s knowledge of the historical composition of building products. Visual identification of

materials suspected to contain asbestos was supported by the collection and analysis of a limited number of representative samples, where applicable. Materials suspected of containing designated substances other than asbestos and lead in paint were identified by appearance, age, and knowledge of historical applications. Equipment that may contain polychlorinated biphenyls (e.g. electrical transformers and fluorescent light ballasts) can often be identified by examining manufacturer's labels.

In Ontario, a material is defined as an Asbestos-Containing Material (ACM) if the material has a minimum asbestos content of 0.5 per cent (%) by dry weight, as O. Reg. 278/05, as amended. ACMs can be divided into two categories: friable and non-friable material. A friable ACM is a material that can be crumbled, powdered, or pulverized by hand pressure and can readily release fibres when disturbed. Common applications of friable ACMs are sprayed or trowelled surfacing materials (e.g. sprayed fireproofing and textured coatings) as well as mechanical and thermal insulation. Non-friable materials are materials that will generally release fibres only when cut or shaped. Common non-friable ACMs include vinyl floor products, caulking applications, asbestos textile products and asbestos cement products (transite). Some of these products may become friable with time or when disturbed.

Representative bulk samples of suspected ACMs were collected by DST during the site investigation. Samples were collected in order to meet the bulk sampling requirements stipulated in O.Reg. 278/05, as amended. The bulk samples were submitted to and analyzed by Paracel Laboratories Ltd. (Paracel). Paracel is an accredited laboratory through the Canadian Association for Laboratory Accreditation (CALA) and the NVLAP. All bulk samples were analyzed using a combination of dispersion staining and polarised light microscopy (PLM). This analytical method complies with the United States Environmental Protection Agency (U.S. EPA) Method 600/R-93/116 dated July 1993, which is the regulatory approved protocol for bulk asbestos analysis in Ontario.

With regards to lead in paint, although the Ontario Ministry of Labour (MoL) has published a guideline for control of lead exposures on construction projects in Ontario, it does not include criteria for the classification of lead-paint. Instead, it uses presumed airborne lead concentrations for specific tasks as criteria for classifying work. However, in regulations set by the United States (U.S.) Department of Housing and Urban Development, lead-based paint is classified as any paint application containing at least 1.0 milligrams of lead per square centimetre of surface area (1.0 mg/cm^2), or at least 0.5% lead content by weight [(5,000 parts per million (ppm)]. This criterion was widely, although not universally, used in Canada. In Canada, the Federal Canada Consumer Product Safety Act's *Surface Coating Materials Regulations SOR/2005-109* has lowered the allowable concentration of lead in paints for new consumer products to 0.009% lead content by weight (90 ppm). For the purposes of the survey and this report, paint applications having detectable concentrations of lead are considered to be lead-containing.

Four (4) paint samples were collected by DST for lead content analysis during the site investigation. All other paints encountered in the project area were in good condition and sampling could not occur without matrix interference (i.e. removing the paint without the substrate material).

The survey involved two (2) ceiling entries above suspended ceiling tiles in Office E123, utilizing Type 2 asbestos precautionary measures, due to the potential presence of suspected asbestos-containing spray-applied fireproofing on structural steel roof system and associated debris.

While on site, the undersigned also conducted ambient Phase Contrast Microscopy (PCM) air sampling outside the Type 2 enclosures in Room E123. The samples were collected using a high-

volume air sampling pump. The pre-calibrated pump was used to draw in a steady amount of air through a filter, which collects airborne fibres. A minimum of 800 litres (L) of air was collected outside the enclosure air samples, and a total airborne fibre concentration criterion limit of 0.05 fibres per cubic centimetre (f/cc), as determined by PCM, was used for these samples. Field blanks were also collected for laboratory quality assurance purposes. Analysis of the samples was performed following the National Institute for Occupational Safety and Health (NIOSH) 7400 'A' counting rules by qualified DST personnel.

Selected photographs are included in Appendix A. Bulk asbestos, lead and PCM analytical results are included in Appendix B.

4.0 BACKGROUND INFORMATION REVIEW

Prior to the commencement of field work, DST project personnel reviewed past hazardous materials bulk sampling documentation, as pertinent to the project areas. As part of the project, DST reviewed the following report:

- Designated Substances Survey, Building M-58, National Research Council of Canada, 1200 Montreal Road, Ottawa, ON. Prepared by Oakhill Environmental, March 2007.

DST referenced the identifiable and applicable sampling and analytical results of the above-noted documentation. DST's field program included the sampling of previously identified ACMs when necessary to meet sampling requirements of O. Reg. 278/05, as amended. DST also sampled any additional suspected ACMs identified and the documented any other Designated Substances encountered.

5.0 FINDINGS

5.1. Asbestos

Table 1 below presents the findings of bulk material samples collected from and applicable to the project area, based on visual observations at the time of the site survey.

Table 1: Summary of Bulk Samples Analyzed for Asbestos Content

Sample I.D.	Sample Location	Sample Description	Asbestos Content and Type
31268-01A	**Block 1 Exterior Finish**	**Exterior Stucco- White and Grey Layers**	**White Layer- 1% Chrysotile Grey Layer- 1% Chrysotile**
31268-01B	Block 4 Exterior Finish		Positive Stop
31268-01C	Block 7 Exterior Finish		Positive Stop
31268-01D	Block 11 Exterior Finish		Positive Stop
31268-01E	Block 10 Exterior Finish		Positive Stop
31268-01F	Block 1 Exterior Finish		Positive Stop
31268-01G	Block 1 Exterior Finish		Positive Stop
31268-02A	Duct Insulation associated with Rooftop Exhaust Duct on Block 1	Black Tarpaper	None Detected
31268-02B			None Detected
31268-02C			None Detected

Table 1: Summary of Bulk Samples Analyzed for Asbestos Content			
Sample I.D.	**Sample Location**	**Sample Description**	**Asbestos Content and Type**
31268-03A	Block 1 Shingle Joints	Yellow Adhesive	None Detected
31268-03B			None Detected
31268-03C			None Detected
31268-04A	Block 6 North Exterior Foundation	Foundation Sand Finish (Painted White)	None Detected
31268-04B			None Detected
31268-04C			None Detected
31268-05A	Block 3 Exterior Around Tap/Outlet Joint	**White Joint Caulking**	None Detected
31268-05B	**Block Exterior 3 Around Tap/Outlet Joint**		**1% Chrysotile**
31268-05C	Block 7- Exterior Around Tap/Outlet Joint		Positive Stop
31268-06A	Skylight 1 Exterior Joints	Grey Window and Joint Caulking	None Detected
31268-06B	Skylight 2 Exterior Joints		None Detected
31268-06C	Skylight 2 Exterior Joints		None Detected
31268-07A	Skylight 1 Exterior Casing	Tar Paper	None Detected
31268-07B	Skylight 2 Exterior Casing		None Detected
31268-07C	Skylight 2 Exterior Casing		None Detected
31268-08A	Block 1 Roof	Roofing Material- Paper Barrier, Insulation, Fibreglass Sheet, Membrane	None Detected
31268-08B			None Detected
31268-08C			None Detected
31268-09A	Skylight 1 Exterior Casing	Black Tar	None Detected
31268-09B	Skylight 2 Exterior Casing		None Detected
31268-09C	Fan Exterior Casing		None Detected
31268-10A	Fan Exterior Casing at Base	Beige Rigid Caulking	None Detected
31268-10B	Fan Exterior Casing at Base		None Detected
31268-10C	Fan Exterior Casing at Base		None Detected
31268-11A	Exterior Vertical Joints- Block 6	Thick Grey Joint Caulking	None Detected
31268-11B	Exterior Vertical Joints- Block 6		None Detected
31268-11C	Exterior Vertical Joints- Block 6		None Detected
31268-12A	Room E123- Skylight 1 Tube Portal	Plaster- White and Grey Layers	None Detected
31268-12B			None Detected
31268-12C			None Detected

Table 1: Summary of Bulk Samples Analyzed for Asbestos Content			
Sample I.D.	**Sample Location**	**Sample Description**	**Asbestos Content and Type**
31268-13A	**Electrical Closet Deck-Adjacent Room E123**	**Spray-On Fireproofing**	**65% Amosite**
31268-13B	Room E123 Deck		Positive Stop
31268-13C			Positive Stop
31268-14A	Room E123-1'X2' Ceiling Tile Backing	Tar Paper Backing	None Detected
31268-14B			None Detected
31268-14C			None Detected
31268-15A	**Block 1 Roof Deck Under Existing Roofing Materials**	**Cementitious Roof Levelling Compound with Vermiculite**	**Concrete Layer-1% Tremolite Black Tar- None Detected**
31268-15B			Concrete Layer- Positive Stop Black Tar- None Detected
31268-15C			Concrete layer- Positive Stop Black Tar- None Detected
31268-16A	Block 5- Middle of Roof	Roofing Material	Roofing Material- None Detected
31268-16B			Roofing Material- None Detected
31268-16C			Roofing Material- None Detected
31268-17A	Block 5- Sloped/Angled Section of Roof	Roofing Material	Roofing Material- None Detected
31268-17B			Roofing Material- None Detected
31268-17C			Roofing Material- None Detected
31268-18A	Block 8- Sloped/Angled Section of Roof	Roofing Material Light Concrete	Roofing Material- None Detected Concrete Layer- None Detected
31268-18B			Roofing Material- None Detected
31268-18C			Roofing Material- None Detected
31268-19A	Block 8- Middle of Roof	Roofing Material Light Concrete	Roofing Material- None Detected Concrete Layer- None Detected
31268-19B			Roofing Material- None Detected
31268-19C			Roofing Material- None Detected
Block 8 – Conc-01A	Block 8 – Roof, South of Roof Divider	Light Concrete	None Detected
31268-20A	Block 5- Railing on Rooftop	White Caulking	None Detected
31268-20B			None Detected
31268-20C			None Detected
31268-21A	Block 5- Around Base of Stack on Rooftop	Dark Grey Caulking	None Detected
31268-21B			None Detected
31268-21C			None Detected

Table 1: Summary of Bulk Samples Analyzed for Asbestos Content			
Sample I.D.	**Sample Location**	**Sample Description**	**Asbestos Content and Type**
31268-22A	Block 5- Around Silver Ventilation Vent on Rooftop	Grey Caulking	None Detected
31268-22B			None Detected
31268-22C			None Detected
31268-23A	Block 5 Rooftop- Around Edges of Perimeter Roofline	Black Caulking	None Detected
31268-23B			None Detected
31268-23C			None Detected
Block 5M-01A	Block 5 Rooftop – Adjacent Northern Access Ladder	Base Roof Membrane	None Detected
Block 5M-01B			None Detected
Block 5M-01C			None Detected
Block 5M-02A		Concrete Base	None Detected
Block 5M-02B			None Detected
Block 5M-02C			None Detected

Bold items represent materials that contain 0.5% or more asbestos, and are considered asbestos-containing materials, as per O. Reg 278/05, as amended.

Based on laboratory analysis, the following materials contain regulated concentrations of asbestos in the project area:

- Approximately five hundred (500) square metres of non-friable textured exterior cladding (both white and grey layers), located on the exterior of the building contain1% Chrysotile asbestos respectively. (DST Sample 31268-01A). The material was observed in primarily good condition.
- Approximately two (2) linear metres of non-friable white joint caulking located on exterior taps and outlets was found to contain 1% Chrysotile asbestos (DST Sample 31268-05B). The material was observed in good condition.
- Approximately twenty-five (25) square metres of friable spray on fireproofing, located on the corrugated steel deck (including structural membranes, any overspray, etc.) above the suspended ceiling of Room E123 was confirmed to contain 65% Amosite asbestos (DST Sample 31268-13A). The material was observed in primarily good to fair condition, but debris was observed laying on the suspended ceiling throughout Room E123.
- Approximately two-hundred (200) square metres of non-friable cementitious roof levelling compound observed under roofing on the deck of Block 1 was confirmed to contain 1% Tremolite asbestos (DST Sample 31268-15A). The material was concealed under existing roofing materials and was in good condition.

White interior window caulking was observed at rooftop level on the skylights located in Room E123 but was at an inaccessible height at the time of the survey. This caulking should be considered asbestos containing until proven otherwise by laboratory analysis.

Bulk sampling and/or onsite visual observations has confirmed that the following materials do not contain regulated concentrations of asbestos in the project area:

- Black tar paper observed on rooftop ductwork on Block 1; (DST Samples 31268-02A-C);
- Yellow adhesive observed on shingle joints on the Block 1 roof (DST Samples 31268-03A-C);

- White foundation sand finish observed on the exterior foundation of Block 6 (DST Samples 31268-04A-C);
- Grey caulking observed on the exterior skylight windows and joints (DST Samples 31268-06A-C);
- Roofing materials from the Block 1, Block 5 and Block 8 roofing systems (DST Samples Block 5M-01A-C, Block 5M-02A-C, 31268-07A-C, 31268-16A-C, 31268-17A-C, 31268-18A-C and 31268-19A-C);
    - Light cement (Samples 31268-18A and 31268-19A, Block 8 -Conc-01A) is not asbestos-containing.
- Tar paper observed on skylight casing tubes on the Block 1 rooftop (DST Samples 31268-08A-C);
- Black tar observed on the exterior casings of the skylights and fans on the rooftop of Block 1 (DST Samples 31268-09A-C);
- Beige rigid caulking observed on the base of fans located on the rooftop of Block 1 (DST Samples 31268-10A-C);
- Thick, grey caulking observed on vertical joints of the exterior of the facility (DST Samples 31268-11A-C);
- White and grey plaster observed on the interior skylight tube casings in Room E123 (DST Samples 31268-12A-C);
- 1'X2' Ceiling tiles and tar paper backing observed in Room E123 (DST Samples 31268-14A-C);
- White caulking, observed around bolts at the base of a rooftop railing on the Block 5 rooftop (DST Samples 31268-20A-C);
- Dark grey caulking, observed around the base of a stack on the Block 5 rooftop (DST Samples 31268-21A-C);
- Grey caulking, observed around a rooftop ventilation duct on the Block 5 rooftop (DST Samples 31268-22A-C); and,
- Black caulking observed at edges of the perimeter roofline on Block 5 (DST Samples 31268-23A-C).

PCM air sampling was conducted outside the Type 2 enclosures in Room E123 during ceiling entry. Analysis of the ambient air samples collected revealed a fibre concentration less than 0.05 fibre per cubic centimetres (f/cc). This fibre concentration is less than 50% the time-weighted average exposure limit of a worker to airborne asbestos (which is defined as 0.1 f/cc) as adopted by the American Conference of Governmental Industrial Hygienists and referenced by the Canada Labour Code - Canada Occupational Health and Safety Regulations, and as per Ontario Regulation 490/09 Designated Substances, as amended. The results are acceptable.

5.2. Lead

Table 2 below presents the findings of bulk lead (in paint) samples collected from the building, based on visual observations at the time of the site survey:

Table 2: Summary of Bulk Paint Samples Analyzed for Lead Content Analysis by ICP-OES

Sample I.D.	Sample Location	Sample Description	Lead Content (ppm or µg/g)
LP-01	Foundation of Block 6	White Paint	25

Table 2: Summary of Bulk Paint Samples Analyzed for Lead Content Analysis by ICP-OES			
Sample I.D.	**Sample Location**	**Sample Description**	**Lead Content (ppm or µg/g)**
LP-02	Foundation of Block 7	White Paint	<20
LP-03	Foundation of Block 10	Grey Paint	<20
LP-04	Foundation of Block 1	Grey Paint	<20

Bold items represent paint applications having a lead concentration above 90 ppm which are considered to be lead-based.

Based on visual observations and bulk sampling analytical results for samples collected by DST, the following paints contain concentrations of lead less than the Federal Canada Consumer Product Safety Act's limit of 90 ppm and are considered non-lead based:

- White paint, located on exterior the foundation of Block 6 (DST sample 28813-LP-01);
- White paint, located on exterior the foundation of Block 7 (DST sample 28813-LP-02);
- Grey paint, located on exterior the foundation of Block 10 (DST sample 28813-LP-03); and
- Grey paint, located on exterior the foundation of Block 1 (DST sample 28813-LP-04).

No other lead paint samples were collected by DST for lead content analysis, as other paints and surface coatings encountered in the project areas were in good condition and sampling without matrix interference (i.e. removing the paint without the substrate material) would have proved difficult. All other paints and surface coatings in the project areas shall be assumed to contain detectable concentrations of lead, unless specific bulk sampling and laboratory analysis confirms otherwise.

5.3. Mercury

Mercury is suspected to be present in the following equipment:

- Fluorescent light fixtures containing fluorescent light tubes were observed on the ceiling of Room E123. Fluorescent light tubes contain mercury in a vapour form and in the phosphor coating on the lamp tube.

5.4. Silica

Based on the historical composition of building materials, silica is expected to be present in:

- Concrete and cement materials;
- Plaster;
- Sand finishes;
- Caulking; and
- Roofing materials.

5.5. Polychlorinated Biphenyls (PCBs)

Polychlorinated Biphenyls (PCBs), also known as Chlorobiphenyls, are hazardous chemicals which were used in the manufacturing of a variety of equipment, such as electrical equipment, heat exchangers, hydraulic systems, and for several other specialized applications. PCBs are commonly found within electrical ballasts manufactured prior to 1981, found within fluorescent light fixtures and high intensity discharge lamps.

Light fixtures with T12 lamps are more likely to contain ballasts that were manufactured prior to 1981. T8 lamps are associated with light fixtures that were manufactured after the phase-out of PCB-containing ballasts. The letter “T” denotes the shape of the light fixture (e.g. tubular) and the number which follows indicates the diameter in eights of an inch.

DST did not disassemble any of the light fixtures in the project areas to identify the presence of ballasts, as the light fixtures were energized at the time of site visit. Based on limited visual observations, DST observed T8 lamps throughout the project areas. Light fixtures with T8 light ballasts are not suspected to contain PCBs.

5.6. Other Designated Substances and Hazardous Materials

The following Designated Substances and Hazardous Materials were neither observed, nor suspected of being present, in forms or quantities that would impact the project work:

- Acrylonitrile;
- Arsenic;
- Benzene;
- Coke Oven Emissions;
- Ethylene Oxide;
- Isocyanates;
- Vinyl Chloride;
- Mould;
- Ozone-depleting substances (ODSs).

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the site investigation, sampling and analysis, the following Designated Substances and hazardous materials are present in forms and quantities expected to have a measurable impact on the Exterior Cladding and Skylight Removal Projects at the NRC Building M-58:

- Asbestos;
- Lead;
- Mercury; and
- Silica.

DST’s recommendations for each material, which are based upon both regulatory compliance and best practice guidelines, are included in the following sections below.

6.1. Asbestos

The disturbance of asbestos-containing materials on construction and demolition projects in the province of Ontario is governed by *O. Reg. 278/05, Asbestos on Construction Projects and in Buildings and Repair Operations* enabled under the *Occupational Health and Safety Act (R.S.O. 1990, Chapter 0.1),* as amended. This regulation classifies all asbestos disturbances as either Low Risk (Type 1), Moderate Risk (Type 2), or High Risk (Type 3), each of which has defined precautionary measures. All asbestos materials are subject to specific handling and disposal precautions, and must be removed prior to demolition or renovation. The Ontario Ministry of Labour (MOL) must be notified of any project involving removal of more than a minor amount (e.g. typically one square metre) of friable asbestos material.

Identified asbestos-containing friable spray on fireproofing requires a minimum of Type 2 abatement procedures under Ontario Regulation 278/05, as amended, when disturbing/removing/repairing one (1) square metre or less of this material. Should renovation or disturbance be required of more than one (1) square metre of friable ACM, Type 3 abatement procedures are required.

Asbestos-containing friable spray on fireproofing was observed concealed within the ceiling space in Room E123. Removal of all or part of a false ceiling to obtain access to a work area, if asbestos-containing material is likely to be laying on the surface of the false ceiling requires minimum Type 2 work procedures.

Asbestos-containing hard finishes such as textured cladding require a minimum of Type 2 abatement procedures under Ontario Regulation 278/05, as amended when using non-powered hand tools or powered hand tools equipped with HEPA filtered devices. If these conditions cannot be met, then Type 3 procedures are necessary.

The removal or disturbance of non-friable ACMs (caulkings, cementitious levelling compound) can be completed using Type 1 asbestos precautionary measures, provided the material is wetted and only non-powered hand-held tools are used. If these conditions cannot be met, then more stringent (Type 2 or Type 3) procedures are required. Where non-asbestos roofing materials cannot be effectively separated from asbestos containing roofing materials, they shall be considered asbestos containing for the purposes of disturbance.

The time weight average exposure limit (TWAEL) for airborne asbestos is prescribed *by O.Reg. 490/09 Designated Substances*, as amended and the *Canada Labour Code, Occupational Health and Safety Regulations*. Work procedures and personal protective equipment must be used to ensure that workers are not exposed to airborne asbestos levels that exceed this TWAEL.

The following recommendations apply to ACMs and suspected ACMs:

1. Appropriate work procedures and precautionary measures must be used, as outlined in *O.Reg. 278/05, PSPC Asbestos Management Directive, and the Canada Labour Code, Canada Occupational Health and Safety Regulations*, as amended, when performing work that may disturb ACMs or suspected ACMs, including prior to building demolition.
2. Disturbance and/or removal of ACMs must be appropriately recorded as part of the building's Asbestos Management Plan.

3. Before undertaking any work activity that involves asbestos-containing materials, an Asbestos Exposure Control Plan shall be developed, in accordance with the requirements of the *Canada Labour Code, Occupational Health and Safety Regulations*, which includes classification of asbestos specific work activities, onsite labelling of ACMs, and education/training of applicable federal employees specific to ACMs.
4. If ACMs or suspected ACMs become damaged and worker exposure to the material is likely to occur, the damaged material must be repaired or removed following work procedures outlined in *O. Reg. 278/05, PSPC Asbestos Management Directive, and Canada Labour Code, Occupational Health and Safety Regulations, as amended.*
5. Disposal of asbestos waste is controlled by the Ontario Environmental Protection Act, *Regulation 347/90, General – Waste Management,* as amended. This regulation requires that asbestos waste be sealed in double containers resistant to puncture and tears, and appropriately labelled. The waste must be disposed at a licensed waste disposal site. Proper notification must be issued to the site representative prior to transportation of waste. The transport of the waste to the disposal site is controlled by the federal *Transportation of Dangerous Goods Act, 1992* (TDGA).

Despite DST's efforts, some ACMs may be concealed and not observed at the time of the survey. As such, should any previously unidentified suspect ACMs be encountered as part of future work, these materials are to be treated as ACMs and handled accordingly, unless sampling proves otherwise. Materials that have not been analyzed, but are visibly similar to other materials identified as asbestos-containing, must be considered asbestos-containing unless proven otherwise by laboratory analysis.

6.2. Lead

The Occupational Health and Safety Branch of the Ontario MoL has published *Guideline: Lead on Construction Projects*. This document classifies all lead disturbances as Type 1, Type 2a, Type 2b, Type 3a or Type 3b work, and assigns different levels of respiratory protection and work procedures for each classification. In the absence of specific legislation for lead on construction projects, this guideline should be followed when disturbing lead-containing materials.

Paints containing elevated concentrations of lead can pose a health risk to humans if ingested or inhaled. Such lead paints are also a risk to the environment with the potential to contaminate soil and groundwater. Paints with elevated lead content can also pose a health risk to workers while completing renovations within the building.

Although the Federal Canada Consumer Product Safety Act's *Surface Coating Materials Regulations SOR/2005-109*, as amended, has set a limit of 90 ppm for surface coating materials, there may be a potential for exposure to high levels of lead depending on the activities performed that disturb the lead-containing materials, even at low lead concentrations. Conducting a risk assessment to assess the potential for exposure should be performed to determine the need to follow procedures such as those in the MoL guideline referenced above.

The TWAEL for airborne lead is prescribed by Ontario Regulation 490/09 *Designated Substances*, as amended. Work procedures and personal protective equipment must be used to ensure that workers are not exposed to airborne lead levels that exceed this TWAEL.

DST recommends that any future disturbance of lead-containing materials avoid operations that generate high levels of dust (e.g. sanding, grinding) and that should these operations be required, appropriate precautionary measures be implemented for worker exposure.

The disposal of construction waste containing lead is governed by O. Reg. 347/90 - General – Waste Management, as amended. The transport of the waste to the disposal site is controlled by the federal Transportation of Dangerous Goods Act (TDGA), 1992.

6.3. Mercury

There are no regulations that specifically govern the disturbance of mercury on construction projects. However, the Occupational Health and Safety Division of the Ontario MoL has published *The Safe Handling of Mercury: A Guide for the Construction Industry*. This document provides advice on how to reduce the risk of mercury exposure, and outlines clean-up methods for spills. In the absence of specific legislation for mercury on construction projects, this guideline would serve as a reasonable, peer reviewed standard for work procedures.

When the removal of fluorescent light tubes is required, the tubes should be removed intact from the fixtures. This prevents worker exposure to mercury vapour, particularly if the tube was energized shortly before removal.

The TWAEL for mercury is prescribed by Ontario Regulation 490/09 *Designated Substances*, as amended. Work procedures and personal protective equipment must be used to ensure that workers are not exposed to airborne mercury levels that exceed this exposure limit.

Liquid mercury is classified as a hazardous waste under O. Reg. 347/90, as amended. The transport of the waste to a disposal site is controlled by O. Reg. 347/90 and by the federal TDGA. It is now common practice to recycle fluorescent light tubes and avoiding the generation of hazardous waste.

6.4. Silica

The Occupational Health and Safety Branch of the Ontario Ministry of Labour have published *Guideline: Silica on Construction Projects*. This document classifies all silica disturbances as Type 1, Type 2 or Type 3 work, and assigns different levels of respiratory protection and work procedures for each classification.

The TWAEL for airborne silica is prescribed by Ontario Regulation 490/09 *Designated Substances*, as amended. Work procedures and personal protective equipment must be used to ensure that workers are not exposed to airborne silica levels that exceed this exposure limit.

As a general rule, it is preferable to use more stringent dust suppression techniques and engineering controls as opposed to relying on respiratory protection to control worker exposure. Respiratory protection should only be relied on as a last resort when dust suppression techniques and engineering controls fail to control worker.

7.0 CLOSURE

A Limitations of Report section, which forms an integral part of this report, is attached.

We trust that the information contained herein meets your needs. Should you have any questions or comments, please do not hesitate to contact us.

DST CONSULTING ENGINEERS INC.

Andrew Cooney, BA, AMRT
Environmental Scientist
acooney@dstgroup.com

Matthew DesRoches, CIH, ROH, M.Sc.(A)
Occupational Hygienist
mdesroches@dstgroup.com

LIMITATIONS OF REPORT

This report is intended for client use only. Any use of this document by a third party, or any reliance on or decisions made based on the findings described in this report, are the sole responsibility of such third parties, and DST Consulting Engineers Inc. accepts no responsibility for damages, suffered by any third party as a result of decisions made or actions conducted based on this report. No other warranties are implied or expressed.

The data, conclusions and recommendations which are presented in this report, and the quality thereof, are based on a scope of work authorized by the client. The sampling program included asbestos/paint bulk sampling in select representative areas for laboratory analysis. There is a practical limitation on the number of intrusive test cuts that can be made and the number of samples that can be collected in an occupied building. This requires the investigator to extrapolate observations and analytical results between test cut locations. The uncertainty, and inherent risk, associated with this necessity increases with the distance between sampling locations. Note, however, that no scope of work, no matter how exhaustive, can guarantee to identify all contaminants. This report therefore cannot warranty that all building conditions are represented by those identified at specific locations.

Recommendations, when included, are made in good faith and are based on several successful experiences.

Any recommendations and conclusions provided that are based on conditions or assumptions reported herein will inherently include any uncertainty associated with those conditions or assumptions.

Note also that standards, guidelines and practices related to environmental investigations may change with time. Those which were applied at the time of this investigation may be obsolete or unacceptable at a later date.

Any comments given in this report on potential remediation problems and possible methods are intended only for the guidance of the designer. The scope of work may not be sufficient to determine all of the factors that may affect construction, clean-up methods and/or costs. Contractors bidding on this project or undertaking clean-ups should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the conditions may affect their work.

Any results from an analytical laboratory or other subcontractor reported herein have been carried out by others, and DST Consulting Engineers Inc. cannot warranty their accuracy. Similarly, DST cannot warranty the accuracy of information supplied by the client.

APPENDIX A

Select Photographs

Photograph 1: Non-friable textured exterior cladding (both white and grey layers), located on the exterior of the building contain 1% Chrysotile asbestos respectively. (DST Sample 31268-01A).

Photo 2: Non-friable white joint caulking located on exterior taps and outlets was found to contain 1% Chrysotile asbestos (DST Sample 31268-05B).

Photo 3: Friable spray on fireproofing, located on the deck above the suspended ceiling of Room E123 was confirmed to contain 65% Amosite asbestos (DST Sample 31268-13A).

Photo 4: Asbestos-containing fireproof debris was observed on the suspended ceiling throughout Room E123.

Photo 5: Non-friable cementitious roof leveling compound, located under existing roofing materials from Block 1 was confirmed to contain 1% Tremolite asbestos (DST Sample 31268-15A).

APPENDIX B

Laboratory Certificates of Analysis – Asbestos, Lead and PCM

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Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G5T9
Attn: Andrew Cooney

Client PO: NRC - M58 Exterior Sampling
Project: GV OT 031268
Custody:

Report Date: 12-Feb-2018
Order Date: 3-Nov-2017
Revised Report **Order #: 1745010**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1745010-01	31268-01A (White Plaster)
1745010-02	31268-01B (White Plaster)
1745010-03	31268-01C (White Plaster)
1745010-04	31268-01D (White Plaster)
1745010-05	31268-01E (White Plaster)
1745010-06	31268-01F (White Plaster)
1745010-07	31268-01G (White Plaster)
1745010-08	31268-01A (Grey Plaster)
1745010-09	31268-01B (Grey Plaster)
1745010-10	31268-01C (Grey Plaster)
1745010-11	31268-01D (Grey Plaster)
1745010-12	31268-01E (Grey Plaster)
1745010-13	31268-01F (Grey Plaster)
1745010-14	31268-01G (Grey Plaster)
1745010-15	31268-02A
1745010-16	31268-02B
1745010-17	31268-02C
1745010-18	31268-03A
1745010-19	31268-03B
1745010-20	31268-03C
1745010-21	31268-04A
1745010-22	31268-04B
1745010-23	31268-04C
1745010-24	31268-05A
1745010-25	31268-05B
1745010-26	31268-05C

Approved By:

Emma Diaz
Senior Analyst

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO: NRC - M58 Exterior Sampling

Report Date: 12-Feb-2018
Order Date: 3-Nov-2017
Project Description: GV OT 031268

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1745010-01	02-Nov-17	sample homogenized	White	Plaster	**Yes**	**Client ID: 31268-01A (White Plaster)**	
						Chrysotile	1
						Non-Fibers	99
1745010-02	02-Nov-17					**Client ID: 31268-01B (White Plaster)**	
						not analyzed	
1745010-03	02-Nov-17					**Client ID: 31268-01C (White Plaster)**	
						not analyzed	
1745010-04	02-Nov-17					**Client ID: 31268-01D (White Plaster)**	
						not analyzed	
1745010-05	02-Nov-17					**Client ID: 31268-01E (White Plaster)**	
						not analyzed	
1745010-06	02-Nov-17					**Client ID: 31268-01F (White Plaster)**	
						not analyzed	
1745010-07	02-Nov-17					**Client ID: 31268-01G (White Plaster)**	
						not analyzed	
1745010-08	02-Nov-17	sample homogenized	Grey	Plaster	**Yes**	**Client ID: 31268-01A (Grey Plaster)**	
						Chrysotile	1
						Non-Fibers	99
1745010-09	02-Nov-17					**Client ID: 31268-01B (Grey Plaster)**	
						not analyzed	
1745010-10	02-Nov-17					**Client ID: 31268-01C (Grey Plaster)**	
						not analyzed	
1745010-11	02-Nov-17					**Client ID: 31268-01D (Grey Plaster)**	
						not analyzed	
1745010-12	02-Nov-17					**Client ID: 31268-01E (Grey Plaster)**	
						not analyzed	
1745010-13	02-Nov-17					**Client ID: 31268-01F (Grey Plaster)**	
						not analyzed	
1745010-14	02-Nov-17					**Client ID: 31268-01G (Grey Plaster)**	
						not analyzed	
1745010-15	02-Nov-17	sample homogenized	Black	Tar	No	**Client ID: 31268-02A**	
						MMVF	10
						Non-Fibers	90

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Order #: 1745010

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO: NRC - M58 Exterior Sampling

Report Date: 12-Feb-2018
Order Date: 3-Nov-2017
Project Description: GV OT 031268

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1745010-16	02-Nov-17	sample homogenized	Black	Tar	No	**Client ID: 31268-02B**	
						MMVF	10
						Non-Fibers	90
1745010-17	02-Nov-17	sample homogenized	Black	Tar	No	**Client ID: 31268-02C**	
						MMVF	10
						Non-Fibers	90
1745010-18	02-Nov-17	sample homogenized	Yellow	Glue	No	**Client ID: 31268-03A**	
						Non-Fibers	100
1745010-19	02-Nov-17	sample homogenized	Yellow	Glue	No	**Client ID: 31268-03B**	
						Non-Fibers	100
1745010-20	02-Nov-17	sample homogenized	Yellow	Glue	No	**Client ID: 31268-03C**	
						Non-Fibers	100
1745010-21	02-Nov-17	sample homogenized	Grey	Plaster	No	**Client ID: 31268-04A**	
						Non-Fibers	100
1745010-22	02-Nov-17	sample homogenized	Grey	Plaster	No	**Client ID: 31268-04B**	
						Non-Fibers	100
1745010-23	02-Nov-17	sample homogenized	Grey	Plaster	No	**Client ID: 31268-04C**	
						Non-Fibers	100
1745010-24	02-Nov-17	sample homogenized	White	Caulking	No	**Client ID: 31268-05A**	
						Non-Fibers	100
1745010-25	02-Nov-17	sample homogenized	White/Grey	Caulking	**Yes**	**Client ID: 31268-05B** [Z-01]	
						Chrysotile	1
						Non-Fibers	99
1745010-26	02-Nov-17					**Client ID: 31268-05C**	
						not analyzed	

** MMVF: Man Made Vitreous Fibers: Fiberglass, Mineral Wool, Rockwool, Glasswool*

**** Analytes in bold indicate asbestos mineral content.**

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	2 - Ottawa West Lab	200812-0	9-Nov-17

** Reference to the NVLAP term does not permit the user of this report to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.*

Qualifier Notes

Sample Qualifiers :

Z-01: Inseparable layers

Work Order Revisions / Comments

Revision 1-revised report includes updated sample ID's.

PARACEL LABORATORIES LTD.

Paracel ID: 1745010

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Chain of Custody
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Page 1 of 1

Client Name:	DST Consulting Engineers	Project Reference:	**Turnaround Time:**
Contact Name:	Andrew Cooney	Quote #: 16-117	☐ Immediate ☐ 1 Day
Address:	2150 Thurston Drive, Ottawa, ON	PO #: NRC- M58 Exterior Sampling	☐ 4 Hour ☐ 2 Day
		Email Address: acooney@dstgroup.com	☐ 8 Hour ☐ 3 Day
Telephone:	613-290-0101 / 613-748-1415	nstrang@dstgroup.com	☑ Regular
			Date Required:_____

ASBESTOS & MOLD ANALYSIS

Matrix: ☐ Air ☑ Bulk ☐ Tape Lift ☐ Swab ☐ Other **Regulatory Guideline:** ☑ ON ☐ QC ☐ AB ☐ SK ☐ Other:____

Analyses: ☐ Microscopic Mold ☐ Culturable Mold ☐ Bacteria GRAM ☐ PCM Asbestos ☑ PLM Asbestos ☐ Chatfield Asbestos ☐ TEM Asbestos

Paracel Order Number: 1745010

	Sample ID	Sampling Date	Air Volume (L)	Analysis Required	Asbestos - Bulk: Identify Distinct Building Materials to Be Analyzed * see below	Asbestos - Bulk: Combine Identified Materials? **see below	Asbestos - Bulk: Positive Stop?
1	01A-G	11/02/2017		PLM	Analyze all layers	☐	☑
2	02A-C	11/02/2017		PLM	Analyze all layers	☐	☑
3	03A-C	11/02/2017		PLM	Analyze all layers	☐	☑
4	04A-C	11/02/2017		PLM	Analyze all layers	☐	☑
5	05A-C	11/02/2017		PLM	Analyze all layers	☐	☑
6						☐	☐
7						☐	☐
8						☐	☐
9						☐	☐
10						☐	☐
11						☐	☐
12						☐	☐

* If left blank, Paracel will analyze all materials identified during analysis ** If left blank, Paracel will analyze all materials as individual samples (**at additional cost**) per EPA 600/R -93/116

Comments:

Method of Delivery: Walk-in

Relinquished By (Sign):	Received at Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Andrew Cooney			
Date/Time: 11/03/2017	Date/Time: Nov 3/17 10:11a	Date/Time: Nov. 3.17 12:25	Date/Time: Nov 6/17 9:01

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Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G5T9
Attn: Andrew Cooney

Client PO: M-58 Skylight/Exterior
Project: GV OT 031268
Custody:

Report Date: 12-Feb-2018
Order Date: 2-Feb-2018
Revised Report **Order #: 1805479**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1805479-01	31268-06A
1805479-02	31268-06B
1805479-03	31268-06C
1805479-04	31268-07A
1805479-05	31268-07B
1805479-06	31268-07C
1805479-07	31268-08A (Tar)
1805479-08	31268-08B (Tar)
1805479-09	31268-08C (Tar)
1805479-10	31268-08A (Tar Membrane)
1805479-11	31268-08B (Tar Membrane)
1805479-12	31268-08C (Tar Membrane)
1805479-13	31268-09A
1805479-14	31268-09B
1805479-15	31268-09C
1805479-16	31268-10A
1805479-17	31268-10B
1805479-18	31268-10C
1805479-19	31268-11A
1805479-20	31268-11A
1805479-21	31268-11C
1805479-22	31268-12A (White Plaster)
1805479-23	31268-12B (White Plaster)
1805479-24	31268-12C (White Plaster)
1805479-25	31268-12A (Grey Plaster)
1805479-26	31268-12B (Grey Plaster)

Approved By:

Heather S.H. McGregor, BSc
Laboratory Director - Microbiology

Certificate of Analysis

Report Date: 12-Feb-2018

Client: DST Consulting Engineers Inc. (Ottawa)

Order Date: 2-Feb-2018

Client PO: M-58 Skylight/Exterior

Project Description: GV OT 031268

1805479-27	31268-12C (Grey Plaster)
1805479-28	31268-13A
1805479-29	31268-13B
1805479-30	31268-13C
1805479-31	31268-14A
1805479-32	31268-14B
1805479-33	31268-14C

Certificate of Analysis

Report Date: 12-Feb-2018

Client: DST Consulting Engineers Inc. (Ottawa)

Order Date: 2-Feb-2018

Client PO: M-58 Skylight/Exterior

Project Description: GV OT 031268

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	*Sample Date*	*Layers Analyzed*	*Colour*	*Description*	*Asbestos Detected:*	*Material Identification*	*% Content*
1805479-01	01-Feb-18	sample homogenized	Grey	Caulking	No	**Client ID: 31268-06A**	
						Non-Fibers	100
1805479-02	01-Feb-18	sample homogenized	Grey	Caulking	No	**Client ID: 31268-06B**	
						Non-Fibers	100
1805479-03	01-Feb-18	sample homogenized	Grey	Caulking	No	**Client ID: 31268-06C**	
						Non-Fibers	100
1805479-04	01-Feb-18	sample homogenized	Grey	Canvas	No	**Client ID: 31268-07A**	
						Cellulose	95
						Non-Fibers	5
1805479-05	01-Feb-18	sample homogenized	Grey	Canvas	No	**Client ID: 31268-07B**	
						Cellulose	95
						Non-Fibers	5
1805479-06	01-Feb-18	sample homogenized	Grey	Canvas	No	**Client ID: 31268-07C**	
						Cellulose	95
						Non-Fibers	5
1805479-07	01-Feb-18	sample homogenized	Black	Tar	No	**Client ID: 31268-08A (Tar)**	
						MMVF	25
						Non-Fibers	75
1805479-08	01-Feb-18	sample homogenized	Black	Tar	No	**Client ID: 31268-08B (Tar)**	
						MMVF	25
						Non-Fibers	75
1805479-09	01-Feb-18	sample homogenized	Black	Tar	No	**Client ID: 31268-08C (Tar)**	
						MMVF	25
						Non-Fibers	75
1805479-10	01-Feb-18	sample homogenized	Yellow/Black	Membrane	No	**Client ID: 31268-08A (Tar Membrane)**	
						MMVF	70
						Non-Fibers	15
						Other fibers	15
1805479-11	01-Feb-18	sample homogenized	Yellow/Black	Membrane	No	**Client ID: 31268-08B (Tar Membrane)**	
						MMVF	70
						Non-Fibers	15
						Other fibers	15

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO: M-58 Skylight/Exterior

Report Date: 12-Feb-2018

Order Date: 2-Feb-2018

Project Description: GV OT 031268

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	*Sample Date*	*Layers Analyzed*	*Colour*	*Description*	*Asbestos Detected:*	*Material Identification*	*% Content*
1805479-12	01-Feb-18	sample homogenized	Yellow/Black	Membrane	No	**Client ID: 31268-08C (Tar Membrane)**	
						MMVF	70
						Non-Fibers	15
						Other fibers	15
1805479-13	01-Feb-18	sample homogenized	Black	Tar	No	**Client ID: 31268-09A**	
						Non-Fibers	100
1805479-14	01-Feb-18	sample homogenized	Black	Tar	No	**Client ID: 31268-09B**	
						Non-Fibers	100
1805479-15	01-Feb-18	sample homogenized	Black	Tar	No	**Client ID: 31268-09C**	
						Non-Fibers	100
1805479-16	01-Feb-18	sample homogenized	Grey	Caulking	No	**Client ID: 31268-10A**	
						Non-Fibers	100
1805479-17	01-Feb-18	sample homogenized	Grey	Caulking	No	**Client ID: 31268-10B**	
						Non-Fibers	100
1805479-18	01-Feb-18	sample homogenized	Grey	Caulking	No	**Client ID: 31268-10C**	
						Non-Fibers	100
1805479-19	01-Feb-18	sample homogenized	Grey	Caulking	No	**Client ID: 31268-11A**	
						Non-Fibers	100
1805479-20	01-Feb-18	sample homogenized	Grey	Caulking	No	**Client ID: 31268-11A**	
						Non-Fibers	100
1805479-21	01-Feb-18	sample homogenized	Grey	Caulking	No	**Client ID: 31268-11C**	
						Non-Fibers	100
1805479-22	01-Feb-18	sample homogenized	White	Plaster	No	**Client ID: 31268-12A (White Plaster)**	
						Non-Fibers	100
1805479-23	01-Feb-18	sample homogenized	White	Plaster	No	**Client ID: 31268-12B (White Plaster)**	
						Non-Fibers	100
1805479-24	01-Feb-18	sample homogenized	White	Plaster	No	**Client ID: 31268-12C (White Plaster)**	
						Non-Fibers	100
1805479-25	01-Feb-18	sample homogenized	Grey	Plaster	No	**Client ID: 31268-12A (Grey Plaster)**	
						Non-Fibers	100
1805479-26	01-Feb-18	sample homogenized	Grey	Plaster	No	**Client ID: 31268-12B (Grey Plaster)**	
						Non-Fibers	100
1805479-27	01-Feb-18	sample homogenized	Grey	Plaster	No	**Client ID: 31268-12C (Grey Plaster)**	
						Non-Fibers	100

PARACEL LABORATORIES LTD.

Order #: 1805479

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO: M-58 Skylight/Exterior

Report Date: 12-Feb-2018
Order Date: 2-Feb-2018
Project Description: GV OT 031268

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	*Sample Date*	*Layers Analyzed*	*Colour*	*Description*	*Asbestos Detected:*	*Material Identification*	*% Content*
1805479-28	01-Feb-18	sample homogenized	Tan	Pipe Wrap	**Yes**	**Client ID: 31268-13A**	
						Amosite	65
						Non-Fibers	35
1805479-29	01-Feb-18					**Client ID: 31268-13B**	
						not analyzed	
1805479-30	01-Feb-18					**Client ID: 31268-13C**	
						not analyzed	
1805479-31	01-Feb-18	sample homogenized	Black	Tar Paper	No	**Client ID: 31268-14A**	
						Cellulose	80
						Non-Fibers	20
1805479-32	01-Feb-18	sample homogenized	Black	Tar Paper	No	**Client ID: 31268-14B**	
						Cellulose	80
						Non-Fibers	20
1805479-33	01-Feb-18	sample homogenized	Black	Tar Paper	No	**Client ID: 31268-14C**	
						Cellulose	80
						Non-Fibers	20

** MMVF: Man Made Vitreous Fibers: Fiberglass, Mineral Wool, Rockwool, Glasswool*

**** Analytes in bold indicate asbestos mineral content.**

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	2 - Ottawa West Lab	200812-0	8-Feb-18

** Reference to the NVLAP term does not permit the user of this report to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.*

Work Order Revisions / Comments

Revision 1-revised report includes updated sample ID's.

PARACEL LABORATORIES LTD.

Paracel ID: 1805479

...e
...t. Laurent Blvd.
...tario K1G 4J8
...9-1947
...paracellabs.com

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: DST Consulting	Project Reference: 6VOT031268
Contact Name: Andrew Cooney	Quote #: 16-117
Address: 2150 Thurston Ottawa, ON	PO #: M-58 Skylight/Exterior
Telephone: 613-290-0101 / 613 748-1415	Email Address: acooney@dstgroup.com

Turnaround Time:
- ☐ Immediate
- ☐ 4 Hour
- ☐ 8 Hour
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☑ Regular

Date Required: _____

ASBESTOS & MOLD ANALYSIS

Matrix: ☐ Air ☑ Bulk ☐ Tape Lift ☐ Swab ☐ Other **Regulatory Guideline:** ☑ ON ☐ QC ☐ AB ☐ SK ☐ Other: ____

Analyses: ☐ Microscopic Mold ☐ Culturable Mold ☐ Bacteria GRAM ☐ PCM Asbestos ☑ PLM Asbestos ☐ Chatfield Asbestos ☐ TEM Asbestos

	Paracel Order Number: / Sample ID	Sampling Date	Air Volume (L)	Analysis Required	Asbestos - Bulk: Identify Distinct Building Materials to Be Analyzed * see below	Combine Identified Materials? **see below	Positive Stop?
1	01 A-C	Feb 1/18		PLM	Analyze all layers found	☐	☑
2	02 A-C					☐	☑
3	03 A-C					☐	☑
4	04 A-C					☐	☑
5	05 A-C					☐	☑
6	06 A-C					☐	☑
7	07 A-C					☐	☑
8	08 A-C					☐	☑
9	09 A-C					☐	☑
10						☐	☐
11						☐	☐
12						☐	☐

* If left blank, Paracel will analyze all materials identified during analysis

** If left blank, Paracel will analyze all materials as individual samples (**at additional cost**) per EPA 600/R -93/116

Comments:

Method of Delivery: Walk-in

Relinquished By (Sign):	Received at Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Andrew Cooney			
Date/Time: Feb 2/18	Date/Time: Feb 2/18 1:01pm	Date/Time: Feb 2/18 3:03	Date/Time:

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Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G5T9
Attn: Andrew Cooney

Client PO: M-58 Skylight Removal
Project: GV OT 031268
Custody: 24663

Report Date: 27-Mar-2018
Order Date: 22-Mar-2018

Order #: 1812564

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1812564-01	31268-15-A (Concrete)
1812564-02	31268-15-B (Concrete)
1812564-03	31268-15-C (Concrete)
1812564-04	31268-15-A (Tar)
1812564-05	31268-15-B (Tar)
1812564-06	31268-15-C (Tar)

Approved By:

Emma Diaz

Senior Analyst

PARACEL LABORATORIES LTD.

Order #: 1812564

Certificate of Analysis

Report Date: 27-Mar-2018

Client: DST Consulting Engineers Inc. (Ottawa)

Order Date: 22-Mar-2018

Client PO: M-58 Skylight Removal

Project Description: GV OT 031268

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	*Sample Date*	*Layers Analyzed*	*Colour*	*Description*	*Asbestos Detected:*	*Material Identification*	*% Content*
1812564-01	22-Mar-18	sample homogenized	Beige	Vermicrete	**Yes**	Client ID: 31268-15-A (Concrete)	
						Tremolite	1
						Non-Fibers	99
1812564-02	22-Mar-18					Client ID: 31268-15-B (Concrete)	
						not analyzed	
1812564-03	22-Mar-18					Client ID: 31268-15-C (Concrete)	
						not analyzed	
1812564-04	22-Mar-18	sample homogenized	Black	Tar	No	Client ID: 31268-15-A (Tar)	
						Non-Fibers	100
1812564-05	22-Mar-18	sample homogenized	Black	Tar	No	Client ID: 31268-15-B (Tar)	
						Non-Fibers	100
1812564-06	22-Mar-18	sample homogenized	Black	Tar	No	Client ID: 31268-15-C (Tar)	
						Non-Fibers	100

**** Analytes in bold indicate asbestos mineral content.**

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	2 - Ottawa West Lab	200812-0	27-Mar-18

** Reference to the NVLAP term does not permit the user of this report to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.*

Work Order Revisions / Comments

None

PARACEL LABORATORIES LTD.

1812564

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319 St. Laurent Blvd.
a, Ontario K1G 4J8
00-749-1947
acel@paracellabs.com

Chain of Custody
(Lab Use Only)
№ 24663

Page 1 of 1

Client Name: DST Consulting	Project Reference: GVOT 031268
Contact Name: Andrew Cooney	Quote #: 16-117
Address: 250 Thurston Ottawa, ON	PO #: M-58 Skylight Removal
Telephone: 613-748-1415	Email Address: acooney@dstgroup.com

Turnaround Time:
☐ Immediate ☐ 1 Day
☐ 4 Hour ☐ 2 Day
☐ 8 Hour ☑ 3 Day
☐ Regular
Date Required:_____

ASBESTOS & MOLD ANALYSIS

Matrix: ☐Air ☑Bulk ☐Tape Lift ☐Swab ☐Other **Regulatory Guideline:** ☑ON ☐QC ☐AB ☐SK ☐Other:____

Analyses: ☐Microscopic Mold ☐Culturable Mold ☐Bacteria GRAM ☑PCM Asbestos ☐PLM Asbestos ☐Chatfield Asbestos ☐TEM Asbestos

Paracel Order Number: 1812564

	Sample ID	Sampling Date	Air Volume (L)	Analysis Required	Asbestos - Bulk: Identify Distinct Building Materials to Be Analyzed * see below	Asbestos - Bulk: Combine Identified Materials? **see below	Asbestos - Bulk: Positive Stop?
1	31268-15-A-C	03/22/18		PLM	All layers	☐	☑
2						☐	☐
3						☐	☐
4						☐	☐
5						☐	☐
6						☐	☐
7						☐	☐
8						☐	☐
9						☐	☐
10						☐	☐
11						☐	☐
12						☐	☐

* If left blank, Paracel will analyze all materials identified during analysis ** If left blank, Paracel will analyze all materials as individual samples (**at additional cost**) per EPA 600/R -93/116

Comments:

Method of Delivery: Walkin

Relinquished By (Sign):	Received at Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Andrew Cooney			
Date/Time: March 22/18	Date/Time: Mar 22/18 10:30a	Date/Time: Mar 23/18 8:30	Date/Time: Mar 23/18 10:56

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Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G5T9
Attn: Andrew Cooney

Client PO:
Project: GV OT 31268
Custody: 26969

Report Date: 24-May-2018
Order Date: 17-May-2018

Order #: 1820576

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1820576-01	16A
1820576-02	16B
1820576-03	16C
1820576-04	17A
1820576-05	17B
1820576-06	17C
1820576-07	18A (Roof Materials)
1820576-08	18B (Roof Materials)
1820576-09	18C (Roof Materials)
1820576-10	18A (Light Cement)
1820576-11	18B (Light Cement)
1820576-12	18C (Light Cement)
1820576-13	19A (Roof Materials)
1820576-14	19B (Roof Materials)
1820576-15	19C (Roof Materials)
1820576-16	19A (Light Cement)
1820576-17	19B (Light Cement)
1820576-18	19C (Light Cement)

Approved By:

Emma Diaz

Senior Analyst

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 24-May-2018

Order Date: 17-May-2018

Project Description: GV OT 31268

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	*Sample Date*	*Layers Analyzed*	*Colour*	*Description*	*Asbestos Detected:*	*Material Identification*	*% Content*
1820576-01	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 16A** [AS-PRE, Z-01]	
						MMVF	20
						Non-Fibers	80
1820576-02	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 16B** [AS-PRE, Z-01]	
						MMVF	20
						Non-Fibers	70
						Other fibers	10
1820576-03	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 16C** [AS-PRE, Z-01]	
						MMVF	20
						Non-Fibers	70
						Other fibers	10
1820576-04	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 17A** [AS-PRE, Z-01]	
						MMVF	20
						Non-Fibers	70
						Other fibers	10
1820576-05	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 17B** [AS-PRE, Z-01]	
						MMVF	20
						Non-Fibers	70
						Other fibers	10
1820576-06	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 17C** [AS-PRE, Z-01]	
						MMVF	20
						Non-Fibers	70
						Other fibers	10
1820576-07	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 18A (Roof Materials)** [AS-PRE, Z-01]	
						MMVF	20
						Non-Fibers	70
						Other fibers	10
1820576-08	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 18B (Roof Materials)** [AS-PRE, Z-01]	
						MMVF	20
						Non-Fibers	70
						Other fibers	10

PARACEL LABORATORIES LTD.

Order #: 1820576

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 24-May-2018

Order Date: 17-May-2018

Project Description: GV OT 31268

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	*Sample Date*	*Layers Analyzed*	*Colour*	*Description*	*Asbestos Detected:*	*Material Identification*	*% Content*
1820576-09	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 18C (Roof Materials)** [AS-PRE, Z-01]	
						Cellulose	10
						MMVF	20
						Non-Fibers	60
						Other fibers	10
1820576-10	17-May-18	sample homogenized	Grey	Cement	No	**Client ID: 18A (Light Cement)**	
						Non-Fibers	100
1820576-11	17-May-18					**Client ID: 18B (Light Cement)** [Z-01a]	
						not analyzed	
1820576-12	17-May-18					**Client ID: 18C (Light Cement)** [Z-01a]	
						not analyzed	
1820576-13	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 19A (Roof Materials)** [AS-PRE, Z-01]	
						MMVF	20
						Non-Fibers	70
						Other fibers	10
1820576-14	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 19B (Roof Materials)** [AS-PRE, Z-01]	
						Cellulose	10
						MMVF	20
						Non-Fibers	60
						Other fibers	10
1820576-15	17-May-18	sample homogenized	Black	Roofing Material	No	**Client ID: 19C (Roof Materials)** [AS-PRE, Z-01]	
						MMVF	20
						Non-Fibers	70
						Other fibers	10
1820576-16	17-May-18	sample homogenized	Grey	Cement	No	**Client ID: 19A (Light Cement)**	
						Non-Fibers	100
1820576-17	17-May-18					**Client ID: 19B (Light Cement)** [Z-01a]	
						not analyzed	
1820576-18	17-May-18					**Client ID: 19C (Light Cement)** [Z-01a]	
						not analyzed	

** MMVF: Man Made Vitreous Fibers: Fiberglass, Mineral Wool, Rockwool, Glasswool*

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 24-May-2018

Order Date: 17-May-2018

Project Description: GV OT 31268

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	2 - Ottawa West Lab	200812-0	24-May-18

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Qualifier Notes

Sample Qualifiers :

AS-PRE: Due to the difficult nature of the bulk sample (interfering fibers/binders), additional NOB preparation was required prior to analysis

Z-01: Inseparable layers

Z-01a: Insufficient cement submitted

Work Order Revisions / Comments

None

PARACEL LABORATORIES LTD.

1820576

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Ontario K1G 4J8
749-1947
@paracellabs.com

Chain of Custody
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No. 26969

Page 1 of 1

Client Name: DST Consulting Eng inc.	Project Reference: GWOT 31268
Contact Name: ANDREW COONEY	Quote #: 16-117
Address: 203-2150 Thurston Dr.	PO #:
Telephone: 343 999 2284	Email Address: acooney@dstgroup.com iwyen@dstgroup.com

Turnaround Time:
☐ Immediate ☐ 1 Day
☐ 4 Hour ☐ 2 Day
☐ 8 Hour ☐ 3 Day
☐ Regular
Date Required:

ASBESTOS & MOLD ANALYSIS

Matrix: ☐Air ☑Bulk ☐Tape Lift ☐Swab ☐Other **Regulatory Guideline:** ☑ON ☐QC ☐AB ☐SK ☐Other:

Analyses: ☐Microscopic Mold ☐Culturable Mold ☐Bacteria GRAM ☐PCM Asbestos ☑PLM Asbestos ☐Chatfield Asbestos ☐TEM Asbestos

	Paracel Order Number: 1820576 / Sample ID	Sampling Date	Air Volume (L)	Analysis Required	Asbestos - Bulk: Identify Distinct Building Materials to Be Analyzed * see below	Combine Identified Materials? **see below	Positive Stop?
1	16A-C	May 17/18		PLM	roof materials	☐	☑
2	17A-C	↓		↓	↓	☐	☑
3	18A-C				& light cement	☐	☑
4	19A-C				& light cement	☐	☑
5						☐	☐
6						☐	☐
7						☐	☐
8						☐	☐
9						☐	☐
10						☐	☐
11						☐	☐
12						☐	☐

* If left blank, Paracel will analyze all materials identified during analysis ** If left blank, Paracel will analyze all materials as individual samples (**at additional cost**) per EPA 600/R -93/116

Comments: please analyze all layers separately

Method of Delivery: Walk-in

Relinquished By (Sign):	Received at Depot:	Received at Lab:	Verified By:
Relinquished By (Print): WISH YEN		Karen Gall	Karen Gall
Date/Time: MAY 17/18 11:30AM	Date/Time: May 17/18 11:22a	Date/Time: May 17/18 2:42	Date/Time: May 18/18 9:08

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Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G5T9
Attn: Andrew Cooney

Client PO:
Project: GV OT 31268
Custody: 26566

Report Date: 28-May-2018
Order Date: 22-May-2018

Order #: 1821105

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1821105-01	20A
1821105-02	20B
1821105-03	20C
1821105-04	21A
1821105-05	21B
1821105-06	21C
1821105-07	22A
1821105-08	22B
1821105-09	22C
1821105-10	23A
1821105-11	23B
1821105-12	23C

Approved By:

Emma Diaz

Senior Analyst

PARACEL LABORATORIES LTD.

Order #: 1821105

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 28-May-2018

Order Date: 22-May-2018

Project Description: GV OT 31268

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	*Sample Date*	*Layers Analyzed*	*Colour*	*Description*	*Asbestos Detected:*	*Material Identification*	*% Content*
1821105-01	16-May-18	sample homogenized	White	Caulking	No	Client ID: 20A	
						Non-Fibers	100
1821105-02	16-May-18	sample homogenized	White	Caulking	No	Client ID: 20B	
						Non-Fibers	100
1821105-03	16-May-18	sample homogenized	White	Caulking	No	Client ID: 20C	
						Non-Fibers	100
1821105-04	16-May-18	sample homogenized	Grey	Caulking	No	Client ID: 21A	
						Cellulose	8
						Non-Fibers	92
1821105-05	16-May-18	sample homogenized	Grey	Caulking	No	Client ID: 21B	
						Cellulose	8
						Non-Fibers	92
1821105-06	16-May-18	sample homogenized	Grey	Caulking	No	Client ID: 21C	
						Cellulose	8
						Non-Fibers	92
1821105-07	16-May-18	sample homogenized	Grey	Caulking	No	Client ID: 22A	
						Non-Fibers	100
1821105-08	16-May-18	sample homogenized	Grey	Caulking	No	Client ID: 22B	
						Non-Fibers	100
1821105-09	16-May-18	sample homogenized	Grey	Caulking	No	Client ID: 22C	
						Non-Fibers	100
1821105-10	16-May-18	sample homogenized	Black	Caulking	No	Client ID: 23A	
						Cellulose	2
						Non-Fibers	98
1821105-11	16-May-18	sample homogenized	Black	Caulking	No	Client ID: 23B	
						Cellulose	2
						Non-Fibers	98
1821105-12	16-May-18	sample homogenized	Black	Caulking	No	Client ID: 23C	
						Cellulose	2
						Non-Fibers	98

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 28-May-2018

Order Date: 22-May-2018

Project Description: GV OT 31268

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	1 - Mississauga	200863-0	28-May-18

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Work Order Revisions / Comments

None

PARACEL LABORATORIES LTD. | TR RE RE

1821105

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o K1G 4J8
947
racellabs.com

Chain of Custody
(Lab Use Only)
№ 26566

Page 1 of 1

Client Name: DST Consulting Eng Inc.	Project Reference: GLOT 31268
Contact Name: ANDREW COONEY	Quote #: 16-117
Address: 203-2150 THUNSONDR.	PO #:
	Email Address: acooney@dstgroup.com
Telephone: 343 999 2284	

Turnaround Time:
☐ Immediate ☐ 1 Day
☐ 4 Hour ☐ 2 Day
☐ 8 Hour ☐ 3 Day
☑ Regular
Date Required:_____

ASBESTOS & MOLD ANALYSIS

Matrix: ☐Air ☑Bulk ☐Tape Lift ☐Swab ☐Other **Regulatory Guideline:** ☑ON ☐QC ☐AB ☐SK ☐Other:____

Analyses: ☐Microscopic Mold ☐Culturable Mold ☐Bacteria GRAM ☐PCM Asbestos ☑PLM Asbestos ☐Chatfield Asbestos ☐TEM Asbestos

	Paracel Order Number: / Sample ID	Sampling Date	Air Volume (L)	Analysis Required	Asbestos - Bulk: Identify Distinct Building Materials to Be Analyzed * see below	Combine Identified Materials? **see below	Positive Stop?
1	20A-C	May16/18		PLM	white caulking	☐	☑
2	21A-C				dark gray caulking	☐	☑
3	22A-C				light gray caulking	☐	☑
4	23A-C				caulking around protrusions - brown	☐	☐
5						☐	☐
6						☐	☐
7						☐	☐
8						☐	☐
9						☐	☐
10						☐	☐
11						☐	☐
12						☐	☐

* If left blank, Paracel will analyze all materials identified during analysis ** If left blank, Paracel will analyze all materials as individual samples **(at additional cost)** per EPA 600/R -93/116

Comments:

Method of Delivery: Courier

Relinquished By (Sign):	Received at Depot:	Received at Lab:	Verified By:
Relinquished By (Print): WISH YEN		Karen Gall	Karen Gall
Date/Time: May 22/18 5PM	Date/Time: MAY 23 18 5:30	Date/Time: May 23/18 9:59	Date/Time: May 23/18 10:20

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Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G 5T9
Attn: Andrew Couturier

Client PO:
Project: GV OT 031268
Custody: 27036

Report Date: 11-Jun-2018
Order Date: 8-Jun-2018

Order #: 1824028

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1824028-01	Block 5M-01A
1824028-02	Block 5M-01B
1824028-03	Block 5M-01C
1824028-04	Block 5M-02A
1824028-05	Block 5M-02B
1824028-06	Block 5M-02c
1824028-07	Block 8-Conc-01A

Approved By:

Heather S.H. McGregor, BSc
Laboratory Director - Microbiology

PARACEL LABORATORIES LTD.

Order #: 1824028

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 11-Jun-2018

Order Date: 8-Jun-2018

Project Description: GV OT 031268

Asbestos, PLM Visual Estimation **MDL - 0.5%**

Paracel I.D.	*Sample Date*	*Layers Analyzed*	*Colour*	*Description*	*Asbestos Detected:*	*Material Identification*	*% Content*
1824028-01	08-Jun-18	sample homogenized	Black	Tar Membrane	No	**Client ID: Block 5M-01A**	
						Cellulose	25
						Non-Fibers	75
1824028-02	08-Jun-18	sample homogenized	Black	Tar Membrane	No	**Client ID: Block 5M-01B**	
						Cellulose	25
						Non-Fibers	75
1824028-03	08-Jun-18	sample homogenized	Black	Tar Membrane	No	**Client ID: Block 5M-01C**	
						Cellulose	25
						Non-Fibers	75
1824028-04	08-Jun-18	sample homogenized	Grey	Concrete Material	No	**Client ID: Block 5M-02A**	
						Non-Fibers	100
1824028-05	08-Jun-18	sample homogenized	Grey	Concrete Material	No	**Client ID: Block 5M-02B**	
						Non-Fibers	100
1824028-06	08-Jun-18	sample homogenized	Grey	Concrete Material	No	**Client ID: Block 5M-02c**	
						Non-Fibers	100
1824028-07	08-Jun-18	sample homogenized	Grey	Concrete Material	No	**Client ID: Block 8-Conc-01A**	
						Non-Fibers	100

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	2 - Ottawa West Lab	200812-0	11-Jun-18

** Reference to the NVLAP term does not permit the user of this report to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.*

Work Order Revisions / Comments

None

PARACEL LABORATORIES LTD.

1824028

ce
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ntario K1G 4J8
'49-1947
@paracellabs.com

Chain of Custody
(Lab Use Only)
Nº 27036

Page 1 of 1

Client Name: DST Consulting Engineers Inc	Project Reference: GV-01-03268
Contact Name: Andrew Couturier / Matt Desroches	Quote #: 16-117
Address: 2150 Thurston Dr, Ottawa, ON K1G 5T9	PO #:
Telephone: 613-697-9326 / 613-748-1415	Email Address: ACouturier@dstgroup.com MDesroches@dstgroup.com

Turnaround Time:
☐ Immediate ☒ 1 Day
☐ 4 Hour ☐ 2 Day
☐ 8 Hour ☐ 3 Day
☐ Regular
Date Required:_____

ASBESTOS & MOLD ANALYSIS

Matrix: ☐Air ☒Bulk ☐Tape Lift ☐Swab ☐Other **Regulatory Guideline:** ☒ON ☐QC ☐AB ☐SK ☐Other:_____

Analyses: ☐Microscopic Mold ☐Culturable Mold ☐Bacteria GRAM ☐PCM Asbestos ☒PLM Asbestos ☐Chatfield Asbestos ☐TEM Asbestos

	Paracel Order Number: 1824028 / Sample ID	Sampling Date	Air Volume (L)	Analysis Required	Asbestos - Bulk: Identify Distinct Building Materials to Be Analyzed * see below	Combine Identified Materials? **see below	Positive Stop?
1	Block 5M-02A-C	June 8/18		PLM	Tar Membrane	☐	☒
2	Block 5M-02A-C	↓		↓	Concrete Material	☐	☒
3	Block 8-Conc-02A	↓		↓	Concrete Material	☐	☐
4						☐	☐
5						☐	☐
6						☐	☐
7						☐	☐
8						☐	☐
9						☐	☐
10						☐	☐
11						☐	☐
12						☐	☐

* If left blank, Paracel will analyze all materials identified during analysis ** If left blank, Paracel will analyze all materials as individual samples **(at additional cost)** per EPA 600/R -93/116

Comments: Do not analyze tar on 02A-C, if any.

Method of Delivery: mail

Relinquished By (Sign):	Received at Depot:	Received at Lab: Karen Cull	Verified By: Karen Cull
Relinquished By (Print): Andrew Couturier	Date/Time: June 8/18 2:16pm	Date/Time: Jun 11/18 10:05	Date/Time: Jun 11/18 10:18
Date/Time: June 8, 2018 / 14:15			

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300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G5T9
Attn: Andrew Cooney

Client PO: NRC-M58 Exterior Sampling
Project:
Custody:

Report Date: 9-Nov-2017
Order Date: 3-Nov-2017

Order #: 1744475

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1744475-01	LP-01
1744475-02	LP-02
1744475-03	LP-03
1744475-04	LP-04

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO: NRC-M58 Exterior Sampling

Report Date: 09-Nov-2017
Order Date: 3-Nov-2017
Project Description:

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-OES	based on MOE E3470, ICP-OES	9-Nov-17	9-Nov-17

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO: NRC-M58 Exterior Sampling

Report Date: 09-Nov-2017
Order Date: 3-Nov-2017
Project Description:

Sample Results

Lead

Matrix: Paint
Sample Date: 02-Nov-17

Paracel ID	Client ID	Units	MDL	Result
1744475-01	LP-01	ug/g	20	25
1744475-02	LP-02	ug/g	20	<20
1744475-03	LP-03	ug/g	20	<20
1744475-04	LP-04	ug/g	20	<20

Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Matrix Blank									
Lead	**ND**	**20**	**ug/g**						
Matrix Duplicate									
Lead	**ND**	**20**	**ug/g**	**ND**			**0.0**	**30**	
Matrix Spike									
Lead	241		ug/L	ND	93.2	70-130			

Paracel ID: 1744475

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p: 1-800-749-1947
e: paracel@paracellabs.com

Chain of Custody (Lab Use Only)

Page 1 of 1

Client Name: DST Consulting Engineers	Project Reference:
Contact Name: Andrew Cooney	Quote # 16-117
Address: 2150 Thurston Drive Ottawa, Ontario	PO # NRC- M58 Exterior Sampling
Telephone: 613-290-0101 or 613-748-1415	Email Address: acooney@dstgroup.com, nstrangs@dstgroup.com

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☑ Regular
Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1744475

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Lead
1	LP-01	P		1	11/02/2017	11:00am	☐	☐	☐	☐	☐	☐	☐	✓
2	LP-02	P		1	11/02/2017	11:00am	☐	☐	☐	☐	☐	☐	☐	✓
3	LP-03	P		1	11/02/2017	11:00am	☐	☐	☐	☐	☐	☐	☐	✓
4	LP-04	P		1	11/02/2017	11:00am	☐	☐	☐	☐	☐	☐	☐	✓
5							☐	☐	☐	☐	☐	☐	☐	☐
6							☐	☐	☐	☐	☐	☐	☐	☐
7							☐	☐	☐	☐	☐	☐	☐	☐
8							☐	☐	☐	☐	☐	☐	☐	☐
9							☐	☐	☐	☐	☐	☐	☐	☐
10							☐	☐	☐	☐	☐	☐	☐	☐

Comments:

Method of Delivery: Walk-in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Andrew Cooney	Date/Time:	Date/Time: Nov 3/17 10:11a	Date/Time: 11/03/17 11:42a
Date/Time: 11/02/2017	Temperature: ____ °C	Temperature: ____ °C	pH Verified [ ] By:

DST Consulting Engineers Inc.
2150 Thurston Drive, Suite 203
Ottawa, Ontario K1G 5T9
Tel.: (613) 748-1415
Fax: (613) 748-1356
E-Mail: ottawa@dstgroup.com

Certificate of Analysis

Location: **NRC- M-58, 1200 Montreal Road, Ottawa, Ontario- Room E123**
DST File No.: **GVOT031268**
Date: **February 1, 2018**
No. of Samples: **4**

Air sampling cassettes were submitted to DST's laboratory for determination of fibre concentrations by Phase Contrast Microscopy (PCM). Samples were prepared and analyzed in accordance with the National Institute of Occupational Safety and Health (NIOSH) Method 7400, dated August 15, 1994. Analysis was performed using the "A" counting Rules.

It should be noted that NIOSH Method 7400 does not differentiate between asbestos and other fibres. Only fibres with a length greater than 5 µm and a length-to-width ratio equal or greater than 3:1 were counted. Fibres with a diameter smaller than 0.25 µm cannot be detected using this method.

Cassette Number	Sample Description (as applicable)	Date Sampled (dd-mm-yy)	Volume (L)	Quantitation Limit (fibres/cm^3)	Results (fibres/mm^2)	Results (fibres/cm^3)
C004695081	Ambient 1- Adjacent to Type 2 Enclosure	1-Feb-18	800	0.05	17	< 0.05
C004695082	Ambient 2- Adjacent to Type 2 Enclosure	1-Feb-18	800	0.05	17	< 0.05
C004695083	Blank 1	1-Feb-18	0	N/A	<7	N/A
C004695084	Blank 2	1-Feb-18	0	N/A	<7	N/A

Note: NIOSH Method 7400 requires the collection of field blanks.
All results presented above incorporate field blank data

Analyst: Andrew Cooney
IRSST Counter ID: 221

TP1 Amount Payable – General

1.1 Subject to any other provisions of the contract, Her Majesty shall pay the Contractor, at the times and in the manner hereinafter set out, the amount by which

1.1.1 the aggregate of the amounts described in TP2 exceeds

1.1.2 the aggregate of the amounts described in TP3

and the Contractor shall accept that amount as payment in full satisfaction for everything furnished and done by him in respect of the work to which the payment relates.

TP2 Amounts Payable to the Contractor

2.1 The amounts referred to in TP1.1.1 are the aggregate of

2.1.1 the amounts referred to in the Articles of Agreement, and

2.1.2 the amounts, if any, that are payable to the Contractor pursuant to the General Conditions.

TP3 Amounts Payable to Her Majesty

3.1 The amounts referred to in TP1.1.2 are the aggregate of the amounts, in any, that the Contractor is liable to pay Her Majesty pursuant to the contract.

3.2 When making any payments to the Contractor, the failure of Her Majesty to deduct an amount referred to in TP3.1 from an amount referred to in TP2 shall not be constitute a waiver of the right to do so, or an admission of lack of entitlement to do so in any subsequent payment to the Contractor.

TP4 Time of Payment

4.1 In these Terms of Payment

4.1.1 The "payment period" means a period of 30 consecutive days or such other longer period as is agreed between the Contractor and the Departmental Representative.

4.1.2 An amount is "due and payable" when it is due and payable by Her Majesty to the Contractor according to TP4.4, TP4.7 or TP4.10.

4.1.3 An amount is overdue when it is unpaid on the first day following the day upon which it is due and payable.

4.1.4 The "date of payment" means the date of the negotiable instrument of an amount due and payable by the Receiver General for Canada and given for payment.

4.1.5 The "Bank Rate" means the discount rate of interest set by the Bank of Canada in effect at the opening of business on the date of payment.

4.2 The Contractor shall, on the expiration of a payment period, deliver to the Departmental Representative in respect of that payment period a written progress claim that fully describes any part of the work that has been completed, and any material that was delivered to the work site but not incorporated into the work during that payment period.

4.3 The Departmental Representative shall, not later than ten days after receipt by him of a progress claim referred to in TP4.2,

4.3.1 inspect the part of the work and the material described in the progress claim; and

4.3.2 issue a progress report, a copy of which the Departmental Representative will give to the Contractor, that indicates the value of the part of the work and the material described in the progress claim that, in the opinion of the Departmental Representative,

4.3.2.1 is in accordance with the contract, and

4.3.2.2 was not included in any other progress report relating to the contract.

4.4 Subject to TP1 and TP4.5 Her Majesty shall, not later than 30 days after receipt by the Departmental Representative of a progress claim referred to in TP4.2, pay the Contractor

4.4.1 an amount that is equal to 95% of the value that is indicated in the progress report referred to in TP4.3.2 if a labour and material payment bond has been furnished by the Contractor, or

4.4.2 an amount that is equal to 90% of the value that is indicated in the progress report referred to in TP4.3.2 if a labour and material payment bond has not been furnished by the Contractor.

4.5 It is a condition precedent to Her Majesty's obligation under TP4.4 that the Contractor has made and delivered to the Departmental Representative,

4.5.1 a statutory declaration described in TP4.6 in respect of a progress claim referred to in TP4.2,

4.5.2 in the case of the Contractor's first progress claim, a construction schedule in accordance with the relevant sections of the Specifications, and

4.5.3 if the requirement for a schedule is specified, an update of the said schedule at the times identified in the relevant sections of the Specifications.

4.6 A statutory declaration referred to in TP4.5 shall contain a deposition by the Contractor that

4.6.1 up to the date of the Contractor's progress claim, the Contractor has complied with all his lawful obligations with respect to the Labour Conditions; and

4.6.2 up to the date of the Contractor's immediately preceding progress claim, all lawful obligations of the Contractor to subcontractors and suppliers of material in respect of the

work under the contract have been fully discharged.

4.7 Subject to TP1 and TP4.8, Her Majesty shall, not later than 30 days after the date of issue of an Interim Certificate of Completion referred to in GC44.2, pay the Contractor the amount referred to in TP1 less the aggregate of

4.7.1 the sum of all payments that were made pursuant to TP4.4;

4.7.2 an amount that is equal to the Departmental Representative's estimate of the cost to Her Majesty or rectifying defects described in the Interim Certificate of Completion; and

4.7.3 an amount that is equal to the Departmental Representative's estimate of the cost to Her Majesty of completing the parts of the work described in the Interim Certificate of Completion other than the defects referred to in TP4.7.2.

4.8 It is a condition precedent to Her Majesty's obligation under TP4.7 that the Contractor has made and delivered to the Departmental Representative,

4.8.1 a statutory declaration described in TP4.9 in respect of an Interim Certificate of Completion referred to in GC44.2, and

4.8.2 if so specified in the relevant sections of the Specifications, and update of the construction schedule referred to in TP4.5.2 and the updated schedule shall, in addition to the specified requirements, clearly show a detailed timetable that is acceptable to the Departmental Representative for the completion of any unfinished work and the correction of all defects.

4.9 A statutory declaration referred to in TP4.8 shall contain a deposition by the contractor that up to the date of the Interim Certificate of Completion the Contractor has

4.9.1 complied with all of the Contractor's lawful obligations with respect to the Labour Conditions;

4.9.2 discharged all of the Contractor's lawful obligations to the subcontractors and suppliers of material in respect of the work under the contract; and

4.9.3 discharged the Contractor's lawful obligations referred to in GC14.6.

4.10 Subject to TP1 and TP4.11, Her Majesty shall, not later than 60 days after the date of issue of a Final Certificate of Completion referred to in GC44.1, pay the Contractor the amount referred to in TP1 less the aggregate of

4.10.1 the sum of all payments that were made pursuant to TP4.4; and

4.10.2 the sum of all payments that were made pursuant to TP4.7.

4.11 It is a condition precedent to Her Majesty's obligation under TP4.10 that the Contractor has made and delivered a statutory declaration described in TP4.12 to the Departmental Representative.

4.12 A statutory declaration referred to in TP4.11 shall, in addition to the depositions described in TP4.9, contain a deposition by the Contractor that all of the Contractor's lawful obligations and any lawful claims against the Contractor that arose out of the performance of the contract have been discharged and satisfied.

TP5 Progress Report and Payment Thereunder Not Binding on Her Majesty

5.1 Neither a progress report referred to in TP4.3 nor any payment made by Her Majesty pursuant to these Terms of Payment shall be construed as an admission by Her Majesty that the work, material or any part thereof is complete, is satisfactory or is in accordance with the contract.

TP6 Delay in Making Payment

6.1 Nothwithstanding GC7 any delay by Her Majesty in making any payment when it is due pursuant to these Terms of Payment shall not be a breach of the contract by Her Majesty.

6.2 Her Majesty shall pay, without demand from the Contractor, simple interest at the Bank Rate plus 1 -1/4 per centum on any amount which is overdue pursuant to TP4.1.3, and the interest shall apply from and include the day such amount became overdue until the day prior to the date of payment except that

6.2.1 interest shall not be payable or paid unless the amount referred to in TP6.2 has been overdue for more that 15 days following

6.2.1.1 the date the said amount became due and payable, or

6.2.1.2 the receipt by the Departmental Representative of the Statutory Declaration referred to in TP4.5, TP4.8 or TP4.11,

whichever is the later, and

6.6.2 interest shall not be payable or paid on overdue advance payments if any.

TP7 Right of Set-off

7.1 Without limiting any right of set-off or deduction given or implied by law or elsewhere in the contract, Her Majesty may set off any amount payable to Her Majesty by the Contractor under this contract or under any current contract against any amount payable to the Contractor under this contract.

7.2 For the purposes of TP7.1, "current contract" means a contract between Her Majesty and the Contractor

7.2.1 under which the Contractor has an undischarged obligation to perform or supply work, labour or material, or

7.2.2 in respect of which Her Majesty has, since the date of which the Articles of Agreement were made, exercised any right to take the work that is the subject of the contract out of the Contractor's hands.

TP8 Payment in Event of Termination

8.1 If the contract is terminated pursuant to GC41, Her Majesty shall pay the Contractor any amount that is lawfully due and payable to the Contractor as soon as is practicable under the circumstances.

TP9 Interest on Settled Claims

9.1 Her Majesty shall pay to the Contractor simple interest on the amount of a settled claim at an average Bank Rate plus 1 ¼ per centum from the date the settled claim was outstanding until the day prior to the date of payment.

9.2 For the purposes of TP9.1,

9.2.1 a claim is deemed to have been settled when an agreement in writing is signed by the Departmental Representative and the Contractor setting out the amount of the claim to be paid by Her Majesty and the items or work for which the said amount is to be paid.

9.2.2 an "average Bank Rate" means the discount rate of interest set by the Bank of Canada in effect at the end of each calendar month averaged over the period the settled claim was outstanding.

9.2.3 a settled claim is deemed to be outstanding from the day immediately following the date the said claim would have been due and payable under the contract had it not been disputed.

9.3 For the purposes of TP9 a claim means a disputed amount subject to negotiation between Her Majesty and the Contractor under the contract.

GC1 Interpretation

1.1 In the contract

1.1.1 where reference is made to a part of the contract by means of numbers preceded by letters, the reference shall be construed to be a reference to the particular part of the contract that is identified by that combination of letters and numbers and to any other part of the contract referred to therein;

1.1.2 "contract" means the contract document referred to in the Articles of Agreement;

1.1.3 "contract security" means any security given by the Contractor to Her Majesty in accordance with the contract;

1.1.4 "Departmental Representative" means the officer or employee or Her Majesty who is designated pursuant to the Articles of Agreement and includes a person specially authorized by him to perform, on his behalf, any of his functions under the contract and is so designated in writing to the Contractor;

1.1.5 "material" includes all commodities, articles and things required to be furnished by or for the Contractor under the contract for incorporation into the work;

1.1.6 "Minister" includes a person acting for, or if the office is vacant, in place of the Minister and his successors in the office, and his or their lawful deputy and any of his or their representatives appointed for the purposes of the contract;

1.1.7 "person" includes, unless the context otherwise requires, a partnership, proprietorship, firm, joint venture, consortium and a corporation;

1.1.8 "plant" includes all animals, tools, implements, machinery, vehicles, buildings, structures, equipment and commodities, articles and things other than material, that are necessary for the due performance of the contract;

1.1.9 "subcontractor' means a person to whom the Contractor has, subject to GC4, subcontracted the whole or any part of the work;

1.1.10 "superintendant" means the employee of the Contractor who is designated by the Contractor to act pursuant to GC19;

1.1.11 "work includes, subject only to any express stipulation in the contract to the contrary, everything that is necessary to be done, furnished or delivered by the Contractor to perform the contract.

1.2 The headings in the contract documents, other than in the Plans and Specifications, form no part of the contract but are inserted for convenience of reference only.

1.3 In interpreting the contract, in the event of discrepancies or conflicts between anything in the Plans and Specifications and the General Conditions, the General Conditions govern.

1.4 In interpreting the Plans and Specifications, in the event of discrepancies or conflicts between

1.4.1 the Plans and Specifications, the Specifications govern;

1.4.2 the Plans, the Plans drawn with the largest scale govern; and

1.4.3 figured dimensions and scaled dimensions, the figured dimensions govern.

GC2 Successors and Assigns

2.1 The contract shall inure to the benefit of and be binding upon the parties hereto and their lawful heirs, executors, administrators, successors and assigns.

GC3 Assignment of Contract

3.1 The contract may not be assigned by the Contractor, either in whole or in part, without the written consent of the Minister.

GC4 Subcontracting by Contractor

4.1 Subject to this General Condition, the Contractor may subcontract any part of the work.

4.2 The Contractor shall notify the Departmental Representative in writing of his intention to subcontract.

4.3 A notification referred to in GC4.2 shall identify the part of the work, and the subcontractor with whom it is intended to subcontract.

4.4 The Departmental Representative may object to the intended subcontracting by notifying the Contractor in writing within six days of receipt by the Departmental Representative of a notification referred to in GC4.2.

4.5 If the Departmental Representative objects to a subcontracting pursuant to GC4.4, the Contractor shall not enter into the intended subcontract.

4.6 The contractor shall not, without the written consent of the Departmental Representative, change a subcontractor who has been engaged by him in accordance with this General Condition.

4.7 Every subcontract entered into by the Contractor shall adopt all of the terms and conditions of ths contract that are of general application.

4.8 Neither a subcontracting nor the Departmental Representative's consent to a subcontracting by the Contractor shall be construed to relieve the Contractor from any obligation under the contract or to impose any liability upon Her Majesty.

GC5 Amendments

5.1 No amendment or change in any of the provisions of the contract shall have any force or effect until it is reduced to writing.

GC6 No Implied Obligations

6.1 No implied terms or obligations of any kind by or on behalf of Her Majesty shall arise from anything in the contract and the express covenants and agreements therein contained and made by Her Majesty are the only covenants and agreements upon which any rights against Her Majesty are to be founded.

6.2 The contract supersedes all communications, negotiations and agreements, either written or oral, relating to the work that were made prior to the date of the contract.

GC7 Time of Essence

7.1 Time is of the essence of the contract.

GC8 Indemnification by Contractor

8.1 The Contractor shall indemnify and save Her Majesty harmless from and against all claims, demand, losses, costs, damages, actions, suits, or proceedings by whomever made, brought or prosecuted and in any manner based upon, arising out of, related to, occasioned by or attributable to the activities of the Contractor, his servants, agents, subcontractors and sub-subcontractors in performing the work including an infringement or an alleged infringement of a patent of invention or any other kind of intellectual property.

8.2 For the purpose of GC8.1, "activities" includes any act improperly carried out, any omission to carry out an act and any delay in carrying out an act.

GC9 Indemnification by Her Majesty

9.1 Her Majesty shall, subject to the Crown Liability Act, the Patent Act, and any other law that affects Her Majesty's rights, powers, privileges or obligations, indemnify and save the Contractor harmless from and against all claims, demands, losses, costs, damage, actions, suits or proceedings arising out of his activities under the contract that are directly attributable to

9.1.1 lack of or a defect in Her Majesty's title to the work site whether real or alleged; or

9.1.2 an infringement or an alleged infringement by the Contractor of any patent of invention or any other kind of intellectual property occurring while the Contractor was performing any act for the purposes of the contract employing a model, plan or design or any other thing related to the work that was supplied by Her Majesty to the Contractor.

GC10 Members of House of Commons Not to Benefit

10.1 As required by the Parliament of Canada Act, it is an express condition of the contract that no member of the House of Commons shall be admitted to any share of part of the contract or to any benefit arising therefrom.

GC11 Notices

11.1 Any notice, consent, order, decision, direction or other communication, other than a notice referred to in GC11.4, that may be given to the Contractor pursuant to the contract may be given in any manner.

11.2 Any notice, consent, order, decision, direction or other communication required to be given in writing, to any party pursuant to the contract shall, subject to GC11.4, be deemed to have been effectively given

11.2.1 to the Contractor, if delivered personally to the Contractor or the Contractor's superintendent, or forwarded by mail, telex or facsimile to the Contractor at the address set out in A4.1, or

11.2.2 to Her Majesty, if delivered personally to the Departmental Representative, or forwarded by mail, telex or facsimile to the Departmental Representative at the address set out in A1.2.1.

11.3 Any such notice, consent, order, decision, direction or other communication given in accordance with GC11.2 shall be deemed to have been received by either party

11.3.1 if delivered personally, on the day that it was delivered,

11.3.2 if forwarded by mail, on the earlier of the day it was received and the sixth day after it was mailed, and

11.3.3 if forwarded by telex or facsimile, 24 hours after it was transmitted.

11.4 A notice given under GC38.1.1, GC40 and GC41, if delivered personally, shall be delivered to the Contractor if the Contractor is doing business as sole proprietor or, if the Contractor is a partnership or corporation, to an officer thereof.

GC12 Material, Plant and Real Property Supplied by Her Majesty

12.1 Subject to GC12.2, the Contractor is liable to Her Majesty for any loss of or damage to material, plant or real property that is supplied or placed in the care, custody and control of the Contractor by Her Majesty for use in connection with the contract, whether or not that loss or damage is attributable to causes beyond the Contractor's control.

12.2 The Contractor is not liable to Her Majesty for any loss or damage to material, plant or real property referred to in GC12.1 if that loss or damage results from and is directly attributable to reasonable wear and tear.

12.3 The Contractor shall not use any material, plant or real property referred to in GC12.1 except for

the purpose of performing this contract.

12.4 When the Contractor fails to make good any loss or damage for which he is liable under GC12.1 within a reasonable time after being required to do so by the Departmental Representative, the Departmental Representative may cause the loss or damage to be made good at the Contractor's expense, and the Contractor shall thereupon be liable to Her Majesty for the cost thereof and shall, on demand, pay to Her Majesty an amount equal to that cost.

12.5 The Contractor shall keep such records of all material, plant and real property referred to in GC12.1 as the Departmental Representative from time to time requires and shall satisfy the Departmental Representative, when requested, that such material, plant and real property are at the place and in the condition which they ought to be.

GC13 Material, Plant and Real Property Become Property of Her Majesty

13.1 Subject to GC14.7 all material and plant and the interest of the Contractor in all real property, licenses, powers and privileges purchased, used or consumed by the Contractor for the contract shall, after the time of their purchase, use or consumption be the property of Her Majesty for the purposes of the work and they shall continue to be the property of Her Majesty.

13.1.1 in the case of material, until the Departmental Representative indicates that he is satisfied that it will not be required for the work, and

13.1.2 in the case of plant, real property, licenses, powers and privileges, until the Departmental Representative indicates that he is satisfied that the interest vested in Her Majesty therein is no longer required for the purposes of the work.

13.2 Material or plant that is the property of Her Majesty by virtue of GC13.1 shall not be taken away from the work site or used or disposed of except for the purposes of the work without the written consent of the Departmental Representative.

13.3 Her Majesty is not liable for loss of or damage from any cause to the material or plant referred to in GC13.1 and the Contractor is liable for such loss or damage notwithstanding that the material or plant is the property of Her Majesty.

GC14 Permits and Taxes Payable

14.1 The Contractor shall, within 30 days after the date of the contract, tender to a municipal authority an amount equal to all fees and charges that would be lawfully payable to that municipal authority in respect of building permits as if the work were being performed for a person other than Her Majesty.

14.2 Within 10 days of making a tender pursuant to GC14.1, the Contractor shall notify the Departmental Representative of his action and of the amount tendered and whether or not the municipal authority has accepted that amount.

14.3 If the municipal authority does not accept the amount tendered pursuant to GC14.1 the Contractor shall pay that amount to Her Majesty within 6 days after the time stipulated in GC14.2.

14.4 For the purposes of GC14.1 to GC14.3 "municipal authority" means any authority that would have jurisdiction respecting permission to perform the work if the owner were not Her Majesty.

14.5 Notwithstanding the residency of the Contractor, the Contractor shall pay any applicable tax arising from or related to the performance of the work under the contract.

14.6 In accordance with the Statutory Declaration referred to in TP4.9, a Contractor who has neither residence nor place of business in the province in which work under the contract is being performed shall provide Her Majesty with proof of registration with the provincial sales tax authorities in the said province.

14.7 For the purpose of the payment of any applicable tax or the furnishing of security for the payment of any applicable tax arising from or related to the performance of the work under the contract, the Contractor shall, notwithstanding the fact that all material, plant and interest of the Contractor in all real property, licenses, powers and privileges, have become the property of Her Majesty after the time of purchase, be liable, as a user or consumer, for the payment or for the furnishing of security for the payment of any applicable tax payable, at the time of the use or consumption of that material, plant or interest of the Contractor in accordance with the relevant legislation.

GC15 Performance of Work under Direction of Departmental Representative

15.1 The Contractor shall

15.1.1 permit the Departmental Representative to have access to the work and its site at all times during the performance of the contract;

15.1.2 furnish the Departmental Representative with such information respecting the performance of the contract as he may require; and

15.1.3 give the Departmental Representative every possible assistance to enable the Departmental Representative to carry out his duty to see that the work is performed in accordance with the contract and to carry out any other duties and exercise any powers specially imposed or conferred on the Departmental Representative under the contract.

CG16 Cooperation with Other Contractors

16.1 Where, in the opinion of the Departmental Representative, it is necessary that other contractors or workers with or without plant and material, be sent onto the work or its site, the Contractor shall, to the satisfaction of the Departmental Representative, allow them access and cooperate with them in the carrying out of their duties and obligation.

16.2 If

16.2.1 the sending onto the work or its site of other contractors or workers pursuant to GC16.1 could not have been reasonably foreseen or anticipated by the Contractor when entering into the contract, and

16.2.2 the Contractor incurs, in the opinion of the Departmental Representative, extra expense in complying with GC16.1, and

16.2.3 The Contractor has given the Departmental Representative written notice of his claim for the extra expense referred to in GC16.2.2 within 30 days of the date that the other contractors or workers were sent onto the work or its site,

Her Majesty shall pay the Contractor the cost, calculated in accordance with GC48 to GC50, of the extra labour, plant and material that was necessarily incurred.

GC17 Examination of Work

17.1 If, at any time after the commencement of the work but prior to the expiry of the warranty or guarantee period, the Departmental Representative has reason to believe that the work or any part thereof has not been performed in accordance with the contract, the Departmental Representative may have that work examined by an expert of his choice.

17.2 If, as a result of an examination of the work referred to in GC17.1, it is established that the work was not performed in accordance with the contract, then, in addition to and without limiting or otherwise affecting any of Her Majesty's rights and remedies under the contract either at law or in equity, the Contractor shall pay Her Majesty, on demand, all reasonable costs and expenses that were incurred by Her Majesty in having that examination performed.

GC18 Clearing of Site

18.1 The Contractor shall maintain the work and its site in a tidy condition and free from the accumulation of waste material and debris, in accordance with any directions of the Departmental Representative.

18.2 Before the issue of an interim certificate referred to in GC44.2, the Contractor shall remove all the plant and material not required for the performance of the remaining work, and all waste material and other debris, and shall cause the work and its site to be clean and suitable for occupancy by Her Majesty's servants, unless otherwise stipulated in the contract.

18.3 Before the issue of a final certificate referred to in GC44.1, the Contractor, shall remove from the work and its site all of the surplus plant and material and any waste material and other debris.

18.4 The Contractor's obligations described in GC18.1 to GC18.3 do not extend to waste material and other debris caused by Her Majesty's servants or contractors and workers referred to in GC16.1.

GC19 Contractor's Superintendent

19.1 The Contractor shall, forthwith upon the award of the contract, designate a superintendent.

19.2 The Contractor shall forthwith notify the Departmental Representative of the name, address and telephone number of a superintendent designate pursuant to GC19.1.

19.3 A superintendent designated pursuant to GC19.1 shall be in full charge of the operations of the Contractor in the performance of the work and is authorized to accept any notice, consent, order, direction, decision or other communication on behalf of the Contractor that may be given to the superintendent under the contract.

19.4 The Contractor shall, until the work has been completed, keep a competent superintendent at the work site during working hours.

19.5 The Contractor shall, upon the request of the Departmental Representative, remove any superintendent who, in the opinion of the Departmental Representative, is incompetent or has been conducting himself improperly and shall forthwith designate another superintendent who is acceptable to the Departmental Representative.

19.6 Subject to GC19.5, the Contractor shall not substitute a superintendent without the written consent of the Departmental Representative.

19.7 A breach by the Contractor of GC19.6 entitles the Departmental Representative to refuse to issue any certificate referred to in GC44 until the superintendent has returned to the work site or another superintendent who is acceptable to the Departmental Representative has been substituted.

GC20 National Security

20.1 If the Minister is of the opinion that the work is of a class or kind that involves the national security, he may order the Contractor

20.1.1 to provide him with any information concerning persons employed or to be employed by him for purposes of the contract; and

20.1.2 to remove any person from the work and its site if, in the opinion of the Minister, that person may be a risk to the national security.

20.2 The Contractor shall, in all contracts with persons who are to be employed in the performance of the contract, make provision for his performance of any obligation that may be imposed upon him under GC19 to GC21.

20.3 The Contractor shall comply with an order of the Minister under GC20.1

GC21 Unsuitable Workers

21.1 The Contractor shall, upon the request of the Departmental Representative, remove any person employed by him for purposes of the contract who, in the opinion of the Departmental Representative, is incompetent or has conducted himself improperly, and the Contractor shall not permit a person who has been removed to return to the work site.

GC22 Increased or Decreased Costs

22.1 The amount set out in the Articles of Agreement shall not be increased or decreased by reason of any increase or decrease in the cost of the work that is brought about by an increase or decrease in the cost of labour, plant or material or any wage adjustment arising pursuant to the Labour Conditions.

22.2 Notwithstanding GC22.1 and GC35, an amount set out in the Articles of Agreement shall be adjusted in the manner provided in GC22.3, if any change in a tax imposed under the Excise Act, the Excise Tax Act, the Old Age Security Act, the Customs Act, the Customs Tariff or any provincial sales tax legislation imposing a retail sales tax on the purchase of tangible personal property incorporated into Real Property

22.2.1 occurs after the date of the submission by the Contractor of his tender for the contract,

22.2.2 applies to material, and

22.2.3 affects the cost to the Contractor of that material.

22.3 If a change referred to in GC22.2 occurs, the appropriate amount set out in the Articles of Agreement shall be increased or decreased by an amount equal to the amount that is established by an examination of the relevant records of the Contractor referred to in GC51 to be the increase or decrease in the cost incurred that is directly attributable to that change.

22.4 For the purpose of GC22.2, where a tax is changed after the date of submission of the tender but public notice of the change has been given by the Minister of Finance before that date, the change shall be deemed to have occurred before the date of submission of the tender.

GC23 Canadian Labour and Material

23.1 The Contractor shall use Canadian labour and material in the performance of the work to the full extent to which they are procurable, consistent with proper economy and expeditious carrying out of the work.

23.2 Subject to GC23.1, the Contractor shall, in the performance of the work, employ labour from the locality where the work is being performed to the extent to which it is available, and shall use the offices of the Canada Employment Centres for the recruitment of workers wherever practicable.

23.3 Subject to GC23.1 and GC23.2, the Contractor shall, in the performance of the work, employ a reasonable proportion of persons who have been on active service with the armed forces of Canada and have been honourably discharged therefrom.

GC24 Protection of Work and Documents

24.1 The Contractor shall guard or otherwise protect the work and its site, and protect the contract, specifications, plans, drawings, information, material, plant and real property, whether or not they are supplied by Her Majesty to the Contractor, against loss or damage from any cause, and he shall not use, issue, disclose or dispose of them without the written consent of the Minister, except as may be essential for the performance of the work.

24.2 If any document or information given or disclosed to the Contractor is assigned a security rating by the person who gave or disclosed it, the Contractor shall take all measures directed by the Departmental Representative to be taken to ensure the maintenance of the degree of security that is ascribed to that rating.

24.3 The Contractor shall provide all facilities necessary for the purpose of maintaining security, and shall assist any person authorized by the Minister to inspect or to take security measures in respect of the work and its site.

24.4 The Departmental Representative may direct the Contractor to do such things and to perform such additional work as the Departmental Representative considers reasonable and necessary to ensure compliance with or to remedy a breach of GC24.1 to GC24.3.

GC25 Public Ceremonies and Signs

25.1 The Contractor shall not permit any public ceremony in connection with the work without the prior consent of the Minister.

25.2 The Contractor shall not erect or permit the erection of any sign or advertising on the work or its site without the prior consent of the Departmental Representative.

GC26 Precautions against Damage, Infringement of Rights, Fire, and Other Hazards

26.1 The Contractor shall, at his own expense, do whatever is necessary to ensure that

26.1.1 no person, property, right, easement or privilege is injured, damaged or infringed by reasons of the Contractor's activities in performing the contract;

26.1.2 pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted or endangered by the performance or existence of the work or plant;

26.1.3 fire hazards in or about the work or its site are eliminated and, subject to any direction that may be given by the Departmental Representative, any fire is promptly extinguished;

26.1.4 the health and safety of all persons employed in the performance of the work is not endangered by the method or means of its performance;

26.1.5 adequate medical services are available to all persons employed on the work or its site at all times during the performance of the work;

26.1.6 adequate sanitation measures are taken in respect of the work and its site; and

26.1.7 all stakes, buoys and marks placed on the work or its site by or under the authority of the Departmental Representative are protected and are not removed, defaced, altered or destroyed.

26.2 The Departmental Representative may direct the Contractor to do such things and to perform such additional work as the Departmental Representative considers reasonable and necessary to ensure

compliance with or to remedy a breach of GC26.1.

26.3 The Contractor shall, at his own expense, comply with a direction of the Departmental Representative made under GC26.2.

GC27 Insurance

27.1 The Contractor shall, at his own expense, obtain and maintain insurance contracts in respect of the work and shall provide evidence thereof to the Departmental Representative in accordance with the requirements of the Insurance Conditions "E".

27.2 The insurance contracts referred to in GC27.1 shall

27.2.1 be in a form, of the nature, in the amounts, for the periods and containing the terms and conditions specified in Insurance Conditions "E", and

27.2.2 provide for the payment of claims under such insurance contracts in accordance with GC28.

GC28 Insurance Proceeds

28.1 In the case of a claim payable under a Builders Risk/Installation (All Risks) insurance contract maintained by the Contractor pursuant to GC27, the proceeds of the claim shall be paid directly to Her Majesty, and

28.1.1 the monies so paid shall be held by Her Majesty for the purposes of the contract, or

28.1.2 if Her Majesty elects, shall be retained by Her Majesty, in which event they vest in Her Majesty absolutely.

28.2 In the case of a claim payable under a General Liability insurance contract maintained by the Contractor pursuant to GC27, the proceeds of the claim shall be paid by the insurer directly to the claimant.

28.3 If an election is made pursuant to GC28.1, the Minister may cause an audit to be made of the accounts of the Contractor and of Her Majesty in respect of the part of the work that was lost, damaged or destroyed for the purpose of establishing the difference, if any, between

28.3.1 the aggregate of the amount of the loss or damage suffered or sustained by Her Majesty, including any cost incurred in respect of the clearing and cleaning of the work and its site and any other amount that is payable by the Contractor to Her Majesty under the contract, minus any monies retained pursuant to GC28.12, and

28.3.2 the aggregate of the amounts payable by Her Majesty to the Contractor pursuant to the contract up to the date of the loss or damage.

28.4 A difference that is established pursuant to GC28.3 shall be paid forthwith by the party who is determined by the audit to be the debtor to the party who is determined by the audit to be the

creditor.

28.5 When payment of a deficiency has been made pursuant to GC28.4, all rights and obligations of Her Majesty and the Contractor under the contract shall, with respect only to the part of the work that was the subject of the audit referred to in GC28.3, be deemed to have been expended and discharged.

28.6 If an election is not made pursuant to GC28.1.2 the Contractor shall, subject to GC28.7, clear and clean the work and its site and restore and replace the part of the work that was lost, damaged or destroyed at his own expense as if that part of the work had not yet been performed.

28.7 When the Contractor clears and cleans the work and its site and restores and replaces the work referred to in GC 28.6, Her Majesty shall pay him out of the monies referred to in GC28.1 so far as they will thereunto extend.

28.8 Subject to GC28.7, payment by Her Majesty pursuant to GC28.7 shall be made in accordance with the contract but the amount of each payment shall be 100% of the amount claimed notwithstanding TP4.4.1 and TP4.4.2.

GC29 Contract Security

29.1 The Contractor shall obtain and deliver contract security to the Departmental Representative in accordance with the provisions of the Contract Security Conditions.

29.2 If the whole or a part of the contract security referred to in GC29.1 is in the form of a security deposit, it shall be held and disposed of in accordance with GC43 and GC45.

29.3 If a part of the contract security referred to in GC29.1 is in the form of a labour and material payment bond, the Contractor shall post a copy of that bond on the work site.

GC30 Changes in the Work

30.1 Subject o GC5, the Departmental Representative may, at any time before he issues his Final Certificate of Completion,

30.1.1 order work or material in addition to that provided for in the Plans and Specifications; and

30.1.2 delete or change the dimensions, character, quantity, quality, description, location or position of the whole or any part of the work or material proved for in the Plans and Specifications or in any order made pursuant to GC30.1.1,

if that additional work or material, deletion, or change is, in his opinion, consistent with the general intent of the original contract.

30.2 The Contractor shall perform the work in accordance with such orders, deletions and changes that are made by the Departmental Representative pursuant to GC30.1 from time to time as if they had appeared in and been part of the Plans and Specifications.

30.3 The Departmental Representative shall determine whether or not anything done or omitted by the Contractor pursuant to an order, deletion or change referred to in GC30.1 increased or decreased the cost of the work to the Contractor.

30.4 If the Departmental Representative determines pursuant to GC30.3 that the cost of the work to the Contractor has been increased, Her Majesty shall pay the Contractor the increased cost that the Contractor necessarily incurred for the additional work calculated in accordance with GC49 or GC50.

30.5 If the Departmental Representative determines pursuant to GC303.3 that the cost of the work to the Contractor has been decreased, Her Majesty shall reduce the amount payable to the Contractor under the contract by an amount equal to the decrease in the cost caused by the deletion or change referred to in GC30.1.2 and calculated in accordance with GC49.

30.6 GC30.3 to GC30.5 are applicable only to a contract or a portion of a contract for which a Fixed Price Arrangement is stipulated in the contract.

30.7 An order, deletion or change referred to in GC30.1 shall be in writing, signed by the Departmental Representative and given to the Contractor in accordance with GC11.

GC31 Interpretation of Contract by Departmental Representative

31.1 If, ar any time before the Departmental Representative has issued a Final Certificate of Completion referred to in GC44.1, any question arises between the parties about whether anything has been done as required by the contract or about what the Contractor is required by the contract to do, and, in particular but without limiting the generality of the foregoing, about

31.1.1 the meaning of anything in the Plans and Specification,

31.1.2 the meaning to be given to the Plans and Specifications in case of any error therein, omission therefrom, or obscurity or discrepancy in their working or intention,

31.1.3 whether or not the quality or quantity of any material or workmanship supplied or proposed to be supplied by the Contractor meets the requirements of the contract,

31.1.4 whether or not the labour, plant or material provided by the Contractor for performing the work and carrying out the contract are adequate to ensure that the work will be performed in accordance with the contract and that the contract will be carried out in accordance with its terms,

31.1.5 what quantity of any kind of work has been completed by the Contractor, or

31.1.6 the timing and scheduling of the various phases of the performance of the work,

the question shall be decided by the Departmental Representative whose decision shall be final and conclusive in respect of the work.

31.2 The Contractor shall perform the work in accordance with any decisions of the Departmental

Representative that are made under GC31.1 and in accordance with any consequential directions given by the Departmental Representative.

GC32 Warranty and Rectification of Defects in Work

32.1 Without restricting any warranty or guarantee implied or imposed by law or contained in the contract documents, the Contractor shall, at his own expense,

32.1.1 rectify and make good any defect or fault that appears in the work or comes to the attention of the Minister with respect to those parts of the work accepted in connection with the Interim Certificate of Completion referred to GC44.2 within 12 months from the date of the Interim Certificate of Completion;

32.1.2 rectify and make good any defect or fault that appears in or comes to the attention of the Minister in connection with those parts of the work described in the Interim Certificate of Completion referred to in GC44.2 within 12 months from the date of the Final Certificate of Completion referred to in GC44.1.

32.2 The Departmental Representative may direct the Contractor to rectify and make good any defect or fault referred to in GC32.1 or covered by any other expressed or implied warranty or guarantee.

32.3 A direction referred to in GC32.2 shall be in writing, may include a stipulation in respect of the time within which a defect or fault is required to be rectified and made good by the Contractor, and shall be given to the Contractor in accordance with GC11.

32.4 The Contractor shall rectify and make good any defect or fault described in a direction given pursuant to GC32.2 within the time stipulated therein.

GC33 Non-Compliance by Contractor

33.1 If the Contractor fails to comply with any decision or direction given by the Departmental Representative pursuant to GC18, GC24, GC26, GC31 or GC32, the Departmental Representative may employ such methods as he deems advisable to do that which the Contractor failed to do.

33.2 The Contractor shall, on demand, pay Her Majesty an amount that is equal to the aggregate of all cost, expenses and damage incurred or sustained by Her Majesty by reason of the Contractor's failure to comply with any decision or direction referred to in GC33.1, including the cost of any methods employed by the Departmental Representative pursuant to GC33.1.

GC34 Protesting Departmental Representative's Decisions

34.1 The Contractor may, within ten days after the communication to him of any decision or direction referred to in GC30.3 or GC33.1, protest that decision or direction.

34.2 A protest referred to in GC34.1 shall be in writing, contain full reasons for the protest, be signed

by the Contractor and be given to Her Majesty by delivery to the Departmental Representative.

34.3 If the Contractor gives a protest pursuant to GC34.2, any compliance by the Contractor with the decision or direction that was protested shall not be construed as an admission by the Contractor of the correctness of that decision or direction, or prevent the Contractor from taking whatever action he considers appropriate in the circumstances.

34.4 The giving of a protest by the Contractor pursuant to GC34.2 shall not relieve him from complying with the decision or direction that is the subject of the protest.

34.5 Subject to GC34.6, the Contractor shall take any action referred to in GC34.3 within three months after the date that a Final Certificate of Completion is issued under GC44.1 and not afterwards.

34.6 The Contractor shall take any action referred to in GC34.3 resulting from a direction under GC32 within three months after the expiry of a warranty or guarantee period and not afterwards.

34.7 Subject to GC34.8, if Her Majesty determines that the Contractor's protest is justified, Her Majesty shall pay the Contractor the cost of the additional labour, plant and material necessarily incurred by the Contractor in carrying out the protested decision or direction.

34.8 Costs referred to in GC34.7 shall be calculated in accordance with GC48 to GC50.

GC35 Changes in Soil Conditions and Neglect or Delay by Her Majesty

35.1 Subject to GC35.2 no payment, other than a payment that is expressly stipulated in the contract, shall be made by Her Majesty to the Contractor for any extra expense or any loss or damage incurred or sustained by the Contractor.

35.2 If the Contractor incurs or sustains any extra expense or any loss or damage that is directly attributable to

35.2.1 a substantial difference between the information relating to soil conditions at the work site that is contained in the Plans and Specifications or other documents supplied to the Contractor for his use in preparing his tender or a reasonable assumption of fact based thereon made by the Contractor, and the actual soil conditions encountered by the Contractor at the work site during the performance of the contract, or

35.2.2 any neglect or delay that occurs after the date of the contract on the part of Her Majesty in providing any information or in doing any act that the contract either expressly requires Her Majesty to do or that would ordinarily be done by an owner in accordance with the usage of the trade,

he shall, within ten days of the date the actual soil conditions described in GC35.2.1 were encountered or the neglect or delay described in GC35.2.2 occurred, give the Departmental Representative written notice of his intention to claim for that extra expense or that loss or damage.

35.3 When the Contractor has given a notice referred to in GC35.2, he shall give the Departmental Representative a written claim for extra expense or loss or damage within 30 days of the date that

a Final Certificate of Completion referred to in GC44.1 is issued and not afterwards.

35.4 A written claim referred to in GC35.3 shall contain a sufficient description of the facts and circumstances of the occurrence that is the subject of the claim to enable the Departmental Representative to determine whether or not the claim is justified and the Contractor shall supply such further and other information for that purpose as the Departmental Representative requires from time to time.

35.5 If the Departmental Representative determines that a claim referred to in GC35.3 is justified, Her Majesty shall make an extra payment to the Contractor in an amount that is calculated in accordance with GC47 to GC50.

35.6 If, in the opinion of the Departmental Representative, an occurrence described in GC35.2.1 results in a savings of expenditure by the Contractor in performing the contract, the amount set out in the Articles of Agreement shall, subject to GC35.7, be reduced by an amount that is equal to the saving.

35.7 The amount of the saving referred to in GC35.6 shall be determined in accordance with GC47 to GC49.

35.8 If the Contractor fails to give a notice referred to in GC35.2 and a claim referred to in GC35.3 within the times stipulated, an extra payment shall not be made to him in respect of the occurrence.

GC36 Extension of Time

36.1 Subject to GC36.2, the Departmental Representative may, on the application of the Contractor made before the day fixed by the Articles of Agreement for completion of the work or before any other date previously fixed under this General Condition, extend the time for its completion by fixing a new date if, in the opinion of the Departmental Representative, causes beyond the control of the Contractor have delayed its completion.

36.2 An application referred to in GC36.1 shall be accompanied by the written consent of the bonding company whose bond forms part of the contract security.

GC37 Assessments and Damages for Late Completion

37.1 For the purposes of this General Condition

37.1.1 the work shall be deemed to be completed on the date that an Interim Certificate of Completion referred to in GC44.2 is issued, and

37.1.2 "period of delay" means the number of days commencing on the day fixed by the Articles of Agreement for completion of the work and ending on the day immediately preceding the day on which the work is completed but does not include any day within a period of extension granted pursuant to GC36.1, and any other day on which, in the opinion of the Departmental Representative, completion of the work was delayed for reasons beyond the control of the Contractor.

37.2 If the Contractor does not complete the work by the day fixed for its completion by the Articles of Agreement but completes it thereafter, the Contractor shall pay Her Majesty an amount equal to the aggregate of

37.2.1 all salaries, wages and travelling expenses incurred by Her Majesty in respect of persons overseeing the performance of the work during the period of delay;

37.2.2 the cost incurred by Her Majesty as a result of the inability to use the completed work for the period of delay; and

37.2.3 all other expenses and damages incurred or sustained by Her Majesty during the period of delay as a result of the work not being completed by the day fixed for its completion.

37.3 The Minister may waive the right of Her Majesty to the whole or any part of the amount payable by the Contractor pursuant to GC37.2 I , in the opinion of the Minister, it is in the public interest to do so.

GC38 Taking the Work Out of the Contractor's Hands

38.1 The Minister may, at his sole discretion, by giving a notice in writing to the Contractor in accordance with GC11, take all or any part of the work out of the Contractor's hands, and may employ such means as he sees fit to have the work completed if the Contractor

38.1.1 Has not, within six days of the Minister or the Departmental Representative giving notice to the Contractor in writing in accordance with GC11, remedied any delay in the commencement or any default in the diligent performance of the work to the satisfaction of the Departmental Representative;

38.1.2 has defaulted in the completion of any part of the work within the time fixed for its completion by the contract;

38.1.3 has become insolvent;

38.1.4 has committed an act of bankruptcy;

38.1.5 has abandoned the work;

38.1.6 has made an assignment of the contract without the consent required by GC3.1; or

38.1.7 has otherwise failed to observe or perform any of the provisions of the contract.

38.2 If the whole or any part of the work is taken out of the Contractor's hands pursuant to GC38.1,

38.2.1 the Contractor's right to any further payment that is due or accruing due under the contract is, subject only to GC38.4, extinguished, and

38.2.2 the Contractor is liable to pay Her Majesty, upon demand, an amount that is equal to the amount of all loss and damage incurred or sustained by Her Majesty in respect of the

Contractor's failure to complete the work.

38.3 If the whole or any part of the work that is taken out of the Contractor's hands pursuant to GC38.1 is completed by Her Majesty, the Departmental Representative shall determine the amount, if any, of the holdback or a progress claim that had accrued and was due prior to the date on which the work was taken out of the Contractor's hands and that is not required for the purposes of having the work performed or of compensating Her Majesty for any other loss or damage incurred or sustained by reason of the Contractor's default.

38.4 Her Majesty may pay the Contractor the amount determined not to be required pursuant to GC38.3.

GC39 Effect of Taking the Work Out of the Contractor's Hands

39.1 The taking of the work or any part thereof out of the Contractor's hands pursuant to GC38 does not operate so as to relieve or discharge him from any obligation under the contract or imposed upon him by law except the obligation to complete the performance of that part of the work that was taken out of his hands.

39.2 If the work or any part thereof is taken out of the Contractor's hands pursuant to GC38, all plant and material and the interest of the Contractor is all real property, licenses, powers and privileges acquired, used or provided by the Contractor under the contract shall continue to be the property of Her Majesty without compensation to the Contractor.

39.3 When the Departmental Representative certifies that any plant, material, or any interest of the Contractor referred to in GC39.2 is no longer required for the purposes of the work, or that it is not in the interest of Her Majesty to retain that plant, material or interest, it shall revert to the Contractor.

G40 Suspension of Work by Minister

40.1 The Minister may, when in his opinion it is in the public interest to do so, require the Contractor to suspend performance of the work either for a specified or an unspecified period by giving a notice of suspension in wiring to the Contractor in accordance with GC11.

40.2 When a notice referred to in GC40.1 is received by the Contractor in accordance with GC11, he shall suspend all operations in respect of the work except those that, in the opinion of the Departmental Representative, are necessary for the care and preservation of the work, plant and material.

40.3 The Contractor shall not, during a period of suspension, remove any part of the work, plant or material from its site without the consent of the Departmental Representative.

40.4 If a period of suspension is 30 days or less, the Contractor shall, upon the expiration of that period, resume the performance of the work and he is entitled to be paid the extra cost, calculated in accordance with GC48 to GC50, of any labour, plant and material necessarily incurred by him as a result of the suspension.

40.5 If, upon the expiration of a period of suspension of more than 30 days, the Minister and the Contractor agree that the performance of the work will be continued by the Contractor, the Contractor shall resume performance of the work subject to any terms and conditions agreed upon by the Minister and the Contractor.

40.6 If, upon the expiration of a period of suspension of more than 30 days, the Minister and the Contractor do not agree that performance of the work will be continued by the Contractor or upon the terms and conditions under which the Contractor will continue the work, the notice of suspension shall be deemed to be a notice of termination pursuant to GC41.

GC41 Termination of Contract

41.1 The Minister may terminate the contract at any time by giving a notice of termination in writing to the Contractor in accordance with GC11.

41.2 When a notice referred to in GC41.1 is received by the Contractor in accordance with GC11, he shall, subject to any conditions stipulated in the notice, forthwith cease all operations in performance of the contract.

41.3 If the contract is terminated pursuant to GC41.1, Her Majesty shall pay the Contractor, subject to GC41.4, an amount equal to

41.3.1 the cost to the contractor of all labour, plant and material supplied by him under the contract up to the date of termination in respect of a contract or part thereof for which a Unit Price Arrangement is stipulated in the contract, or

41.3.2 the lesser of

41.3.2.1 an amount, calculated in accordance with the Terms and Payment, that would have been payable to the Contractor had he completed the work, and

41.3.2.2 an amount that is determined to be due to the Contractor pursuant to GC49 in respect of a contract or part thereof for which a Fixed Price Arrangement is stipulated in the contract

less the aggregate of all amounts that were paid to the Contractor by Her Majesty and all amounts that are due to Her Majesty from the Contractor pursuant to the contract.

41.4 If Her Majesty and the Contractor are unable to agree about an amount referred to in GC41.3 that amount shall be determined by the method referred to in GC50.

GC42 Claims Against and Obligations of the Contractor or Subcontractor

42.1 Her Majesty may, in order to discharge lawful obligations of and satisfy claims against the Contractor or a subcontractor arising out of the performance of the contract, pay any amount that is due and payable to the Contractor pursuant to the contract directly to the obligees of and the claimants against the Contractor or the subcontractor but such amount if any, as is paid by Her Majesty, shall not exceed that amount which the Contractor would have been obliged to pay to

such claimant had the provisions of the Provincial or Territorial lien legislation, or, in the Province of Quebec, the law relating to privileges, been applicable to the work. Any such claimant need not comply with the provisions of such legislation setting out the steps by way of notice, registration or otherwise as might have been necessary to preserve or perfect any claim for lien or privilege which claimant might have had;

42.2 Her Majesty will not make any payment as described in GC42.1 unless and until that claimant shall have delivered to Her Majesty:

42.2.1 a binding and enforceable Judgment or Order of a court of competent jurisdiction setting forth such amount as would have been payable by the Contractor to the claimant pursuant to the provisions of the applicable Provincial or Territorial lien legislation, or, in the Province of Quebec, the law relating to privileges, had such legislation been applicable to the work; or

42.2.2 a final and enforceable award of an arbitrator setting forth such amount as would have been payable by the Contractor to the claimant pursuant to the provisions of the applicable Provincial or Territorial lien legislation, or, in the Province of Quebec, the law relating to privileges, had such legislation been applicable to the work; or

42.2.3 the consent of the Contractor authorizing a payment.

For the purposes of determining the entitlement of a claimant pursuant to GC42.2.1 and GC42.2.2, the notice required by GC42.8 shall be deemed to replace the registration or provision of notice after the performance of work as required by any applicable legislation and no claim shall be deemed to have expired, become void or unenforceable by reason of the claimant not commencing any action within the time prescribed by any applicable legislation.

42.3 The Contractor shall, by the execution of his contract, be deemed to have consented to submit to binding arbitration at the request of any claimant those questions that need be answered to establish the entitlement of the claimant to payment pursuant to the provisions of GC42.1 and such arbitration shall have as parties to it any subcontractor to whom the claimant supplied material, performed work or rented equipment should such subcontractor wish to be adjoined and the Crown shall not be a party to such arbitration and, subject to any agreement between the Contractor and the claimant to the contrary, the arbitration shall be conducted in accordance with the Provincial or Territorial legislation governing arbitration applicable in the Province or Territory in which the work is located.

42.4 A payment made pursuant to GC42.1 is, to the extent of the payment, a discharge of Her Majesty's liability to the Contractor under the contract and may be deducted from any amount payable to the Contractor under the contract.

42.5 To the extent that the circumstances of the work being performed for Her Majesty permit, the Contractor shall comply with all laws in force in the Province or Territory where the work is being performed relating to payment period, mandatory holdbacks, and creation and enforcement of mechanics' liens, builders' liens or similar legislation or in the Province of Quebec, the law relating to privileges.

42.6 The Contractor shall discharge all his lawful obligations and shall satisfy all lawful claims against him arising out of the performance of the work at least as often as the contract requires Her

Majesty to pay the Contractor.

42.7 The Contractor shall, whenever requested to do so by the Departmental Representative, make a statutory declaration deposing to the existence and condition of any obligations and claims referred to in GC42.6.

42.8 GC42.1 shall only apply to claims and obligations

42.8.1 the notification of which has been received by the Departmental Representative in writing before payment is made to the Contractor pursuant to TP4.10 and within 120 days of the date on which the claimant

42.8.1.1 should have been paid in full under the claimant's contract with the Contractor or subcontractor where the claim is for money that was lawfully required to be held back from the claimant; or

42.8.1.2 performed the last of the services, work or labour, or furnished the last of the material pursuant to the claimant's contract with the Contractor or subcontractor where the claim is not for money referred to in GC42.8.1.1, and

42.8.2 the proceedings to determine the right to payment of which, pursuant to GC42.2. shall have commenced within one year from the date that the notice referred to in GC42.8.1 was received by the Departmental Representative, and

the notification required by GC42.8.1 shall set forth the amount claimed to be owing and the person who by contract is primarily liable.

42.9 Her Majesty may, upon receipt of a notice of claim under GC42.8.1, withhold from any amount that is due and payable to the Contractor pursuant to the contract the full amount of the claim or any portion thereof.

42.10 The Departmental Representative shall notify the Contractor in writing of receipt of any claim referred to in GC42.8.1 and of the intention of Her Majesty to withhold funds pursuant to GC42.9 and the Contractor may, at any time thereafter and until payment is made to the claimant, be entitled to post, with Her Majesty, security in a form acceptable to Her Majesty in an amount equal to the value of the claim, the notice of which is received by the Departmental Representative and upon receipt of such security Her Majesty shall release to the Contractor any funds which would be otherwise payable to the Contractor, that were withheld pursuant to the provisions of GC42.9 in respect of the claim of any claimant for whom the security stands.

GC43 Security Deposit – Forfeiture or Return

43.1 If

43.1.1 the work is taken out of the Contractor's hands pursuant to GC38,

43.1.2 the contract is terminated pursuant to GC41, or

43.1.3 the Contractor is in breach of or in default under the contract,

Her Majesty may convert the security deposit, if any, to Her own use.

43.2 If Her Majesty converts the contract security pursuant to GC43.1, the amount realized shall be deemed to be an amount due from Her Majesty to the Contractor under the contract.

43.3 Any balance of an amount referred to in GC43.2 that remains after payment of all losses, damage and claims of Her Majesty and others shall be paid by Her Majesty to the Contractor if, in the opinion of the Departmental Representative, it is not required for the purposes of the contract.

GC44 Departmental Representative's Certificates

44.1 On the date that

44.1.1 the work has been completed, and

44.1.2 the Contractor has complied with the contract and all orders and directions made pursuant thereto,

both to the satisfaction of the Departmental Representative, the Departmental Representative shall issue a Final Certificate of Completion to the Contractor.

44.2 If the Departmental Representative is satisfied that the work is substantially complete he shall, at any time before he issues a certificate referred to in GC44.1, issue an Interim Certificate of Completion to the Contractor, and

44.2.1 for the purposes of GC44.2 the work will be considered to be substantially complete,

44.2.1.1 when the work under the contract or a substantial part thereof is, in the opinion of the Departmental Representative, ready for use by Her Majesty or is being used for the purpose intended; and

44.2.1.2 when the work remaining to be done under the contract is, in the opinion of the Departmental Representative, capable of completion or correction at accost of not more that

44.2.1.2.1 -3% of the first $500,000, and

44.2.1.2.2 -2% of the next $500,000, and

44.2.1.2.3 -1% of the balance

of the value of the contract at the time this cost is calculated.

44.3 For the sole purpose of GC44.2.1.2, where the work or a substantial part thereof is ready for use or is being used for the purposes intended and the remainder of the work or a part thereof cannot be completed by the time specified in A2.1, or as amended pursuant to GC36, for reasons beyond the control of the Contractor or where the Departmental Representative and the Contractor agree not to complete a part of the work within the specified time, the cost of that part of the work

which was either beyond the control of the Contractor to complete or the Departmental Representative and the Contractor have agreed not to complete by the time specified shall be deducted from the value of the contract referred to GC44.2.1.2 and the said cost shall not form part of the cost of the work remaining to be done in determining substantial completion.

44.4 An Interim Certificate of Completion referred to in GC44.2 shall describe the parts of the work not completed to the satisfaction of the Departmental Representative and all things that must be done by the Contractor

44.4.1 before a Final Certificate of Completion referred to in GC44.1 will be issued, and

44.4.2 before the 12-month period referred to in GC32.1.2 shall commence for the said parts and all the said things.

44.5 The Departmental Representative may, in addition to the parts of the work described in an Interim Certificate of Completion referred to in GC44.2, require the Contractor to rectify any other parts of the work not completed to his satisfaction and to do any other things that are necessary for the satisfactory completion of the work.

44.6 If the contract or a part thereof is subject to a Unit Price Arrangement, the Departmental Representative shall measure and record the quantities of labour, plant and material, performed, used and supplied by the Contractor in performing the work and shall, at the request of the Contractor, inform him of those measurements.

44.7 The Contractor shall assist and co-operate with the Departmental Representative in the performance of his duties referred to in GC44.6 and shall be entitled to inspect any record made by the Departmental Representative pursuant to GC44.6.

44.8 After the Departmental Representative has issued a Final Certificate of Completion referred to in GC44.1, he shall, if GC44.6 applies, issue a Final Certificate of Measurement.

44.9 A Final Certificate of Measurement referred to in GC44.8 shall

44.9.1 contain the aggregate of all measurements of quantities referred to in GC44.6, and

44.9.2 be binding upon and conclusive between Her Majesty and the Contractor as to the quantities referred to therein.

GC45 Return of Security Deposit

45.1 After an Interim Certificate of Completion referred to in GC44.2 has been issued, Her Majesty shall, if the Contractor is not in breach of or in default under the contract, return to the Contractor all or any part of the security deposit that, in the opinion of the Departmental Representative, is not required for the purposes of the contract.

45.2 After a Final Certificate of Completion referred to in GC44.1 has been issued, Her Majesty shall return to the Contractor the remainder of any security deposit unless the contract stipulates otherwise.

45.3 If the security deposit was paid into the Consolidated Revenue Fund of Canada, Her Majesty shall pay interest thereon to the Contractor at a rate established from time to time pursuant to section 21(2) of the Financial Administration Act.

GC46 Clarification of Terms in GC47 to GC50

46.1 For the purposes of GC47 to GC50,

46.1.1 "Unit Price Table" means the table set out in the Articles of Agreement, and

46.1.2 "plant" does not include tools customarily provided by a tradesman in practicing his trade.

GC47 Additions or Amendments to Unit Price Table

47.1 Where a Unit Price Arrangement applies to the contract or a part thereof the Departmental Representative and the Contractor may, by an agreement in writing,

47.1.1 add classes of labour or material, and units of measurement, prices per unit and estimated quantities to the Unit Price Table if any labour, plant or material that is to be included in the Final Certificate of Measurement referred to in GC44.8 is not included in any class of labour, plant or material set out in the Unit Price Table; or

47.1.2 subject to GC47.2 and GC47.3, amend a price set out in the Unit Price Table for any class of labour, plant or material included therein if the Final Certificate of Measurement referred to in GC44.8 shows or is expected to show that the total quantity of that class of labour, plant or material actually performed, used or supplied by the Contractor in performing the work is

47.1.2.1 less than 85% of that estimated total quantity, or

47.1.2.2 in excess of 115% of that estimated total quantity.

47.2 In no event shall the total cost of an item set out in the Unit Price Table that has been amended pursuant to GC47.1.2.1 exceed the amount that would have been payable to the Contractor had the estimated total quantity actually been performed, used or supplied.

47.3 An amendment that is made necessary by GC47.1.2.2 shall apply only to the quantities that are in excess of 115%.

47.4 If the Departmental Representative and the Contractor do not agree as contemplated in GC47.1, the Departmental Representative shall determine the class and the unit of measurement of the labour, plant or material and, subject to GC47.2 and GC47.3, the price per unit therefore shall be determined in accordance with GC50.

GC48 Determination of Cost – Unit Price Table

48.1 Whenever, for the purposes of the contract, it is necessary to determine the cost of labour, plant or material, it shall be determined by multiplying the quantity of that labour, plant or material expressed in the unit set out in column 3 of the Unit Price Table by the price of that unit set out in column 5 of the Unit Price Table.

GC49 Determination of Cost – Negotiation

49.1 If the method described in GC48 cannot be used because the labour, plant or material is of a kind or class that is not set out in the Unit Price Table, the cost of that labour, plant or material for the purposes of the contract shall be the amount agreed upon from time to time by the Contractor and the Departmental Representative.

49.2 For the purposes of GC49.1, the Contractor shall submit to the Departmental Representative any necessary cost information requested by the Departmental Representative in respect of the labour, plant and material referred to in GC49.1

GC50 Determination of Cost – Failing Negotiation

50.1 If the methods described in GC47, GC48 or GC49 fail for any reason to achieve a determination of the cost of labour, plant and material for the purposes referred to therein, that cost shall be equal to the aggregate of

50.1.1 all reasonable and proper amounts actually expended or legally payable by the Contractor in respect of the labour, plant and material that falls within one of the classes of expenditure described in GC50.2 that are directly attributable to the performance of the contract,

50.1.2 an allowance for profit and all other expenditures or costs, including overhead, general administration cost, financing and interest charges, and every other cost, charge and expenses, but not including those referred to in GC50.1.1 or GC50.1.3 or a class referred to in GC50.2, in an amount that is equal to 10% of the sum of the expenses referred to in GC50.1.1, and

50.1.3 interest on the cost determined under GC50.1.1 and GC50.1.2, which interest shall be calculated in accordance with TP9,

provide that the total cost of an item set out n the Unit Price Table that is subject to the provisions of GC47.1.2.1 does not exceed the amount that would have been payable to the Contractor had the estimated total quantity of the said item actually be performed, used or supplied.

50.2 For purposes of GC50.1.1 the classes of expenditure that may be taken into account in determining the cost of labour, plant and material are,

50.2.1 payments to subcontractors;

50.2.2 wages, salaries and travelling expenses of employees of the Contractor while they are actually and properly engaged on the work, other than wages, salaries, bonuses, living

and travelling expenses of personnel of the Contractor generally employed at the head office or at a general office of the Contractor unless they are engaged at the work site with the approval of the Departmental Representative,

50.2.3 assessments payable under any statutory authority relating to workmen's compensation, unemployment insurance, pension plan or holidays with pay;

50.2.4 rent that is paid for plant or an amount equivalent of the said rent if the plant is owned by the Contractor that is necessary for and used in the performance of the work, if the rent of the equivalent amount is reasonable and use of that plant has been approved by the Departmental Representative;

50.2.5 payments for maintaining and operating plant necessary for and used in the performance of the work, and payments for effecting such repairs thereto as, in the opinion of the Departmental Representative, are necessary to the proper performance of the contract other than payments for any repairs to the plant arising out of defects existing before its allocation to the work;

50.2.6 payments for material that is necessary for and incorporated in the work, or that is necessary for and consumed in the performance of the contract;

50.2.7 payments for preparation, delivery, handling, erection, installation, inspection protection and removal of the plant and material necessary for and used in the performance of the contract; and

50.2.8 any other payments made by the Contractor with the approval of the Departmental Representative that are necessary for the performance of the contract.

GC51 Records to be kept by Contractor

51.1 The Contractor shall

51.1.1 maintain full records of his estimated and actual cost of the work together with all tender calls, quotations, contracts, correspondence, invoices, receipts and vouchers relating thereto.

51.1.2 make all records and material referred to in GC5.1.1 available to audit and inspection by the Minister and the Deputy Receiver General for Canada or by persons acting on behalf of either of both of them, when requested;

51.1.3 allow any of the person referred to in GC51.1.2 to make copies of and to take extracts from any of the records and material referred to in GC51.1.1; and

51.1.4 furnish any person referred to in GC51.1.2 with any information he may require from time to time in connection with such records and material.

51.2 The records maintained by the Contractor pursuant to GC51.1.1 shall be kept intact by the Contractor until the expiration of two years after the date that a Final Certificate of Completion referred to in GC44.1 was issued or until the expiration of such other period of time as the

Minister may direct.

51.3 The Contractor shall cause all subcontractors and all other persons directly or indirectly controlled by or affiliated with the Contractor and all persons directly or indirectly having control of the Contractor to comply with GC51.1 and GC51.2 as if they were the Contractor.

GC52 Conflict of Interest

52.1 It is a term of this contract that no former public office holder who is not in compliance with the Conflict of Interest and Post-Employment Code for Public Office Holders shall derive a direct benefit from this contract.

GC53 Contractor Status

53.1 The Contractor shall be engaged under the contract as an independent contractor.

53.2 The Contractor and any employee of the said Contractor is not engaged by the contract as an employee, servant or agent of Her Majesty.

53.3 For the purposes of GC53.1 and GC53.2 the Contractor shall be solely responsible for any and all payments and deductions required to be made by law including those required for Canada or Quebec Pension Plans, Unemployment Insurance, Worker's Compensation or Income Tax.

GENERAL CONDITONS

IC 1 Proof of Insurance
IC 2 Risk Management
IC 3 Payment of Deductible
IC 4 Insurance Coverage

GENERAL INSUANCE COVERAGES

GCI 1 Insured
GIC 2 Period of Insurance
GIC 3 Proof of Insurance
GIC 4 Notification

COMMERCIAL GENERAL LIABILITY

CGL 1 Scope of Policy
CGL 2 Coverages/Provisions
CGL 3 Additional Exposures
CGL 4 Insurance Proceeds
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BUILDER'S RISK – INSTALLATION FLOATER – ALL RISKS

BR 1 Scope of Policy
BR 2 Property Insured
BR 3 Insurance Proceeds
BR 4 Amount of Insurance
BR 5 Deductible
BR 6 Subrogation
BR 7 Exclusion Qualifications

INSURER'S CERTIFICATE OF INSURANCE

General Conditions

IC 1 Proof of Insurance
(02/12/03)

Within thirty (30) days after acceptance of the Contractor's tender, the Contractor shall, unless otherwise directed in writing by the Contracting Officer, deposit with the Contracting Officer an Insurer's Certificate of Insurance in the form displayed in this document and, if requested by the Contracting Officer, the originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the Insurance Coverage Requirements shown hereunder.

IC 2 Risk Management
(01/10/94)

The provisions of the Insurance Coverage Requirements contained hereunder are not intended to cover all of the Contractor's obligations under GC8 of the General Conditions "C" of the contract. Any additional risk management measures or additional insurance coverages the Contractor may deem necessary to fulfill its obligations under GC8 shall be at its own discretion and expense.

IC 3 Payment of Deductible
(01/10/94)

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

IC 4 Insurance Coverage
(02/12/03)

The Contractor has represented that it has in place and effect the appropriate and usual liability insurance coverage as required by these Insurance Conditions and the Contractor has warranted that it shall obtain, in a timely manner and prior to commencement of the Work, the appropriate and usual property insurance coverage as required by these Insurance Conditions and, further, that it shall maintain all required insurance policies in place and effect as required by these Insurance Conditions.

INSURANCE COVERAGE REQUIREMENTS

PART I
GENERAL INSUANCE COVERAGES (GIC)

GCI 1 Insured
(02/12/03)

Each insurance policy shall insure the Contractor, and shall include, as an Additional Named Insured, Her Majesty the Queen in right of Canada, represented by the National Research Council Canada.

GIC 2 Period of Insurance
(02/12/03)

Unless otherwise directed in writing by the Contracting Officer or otherwise stipulated elsewhere in these Insurance Conditions, the policies required hereunder shall be in force and be maintained from the date of the contract award until the day of issue of the Departmental Representative's Final Certificate of Completion.

GIC 3 Proof of Insurance
(01/10/94)

Within twenty five (25) days after acceptance of the Contractor's tender, the Insurer shall, unless otherwise directed by the Contractor, deposit with the Contractor an Insurer's Certificate of Insurance in the form displayed in the document and, if requested, the originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the requirements of these Insurance Coverages.

GIC 4 Notification
(01/10/94)

Each Insurance policy shall contain a provision that (30) days prior written notice shall be given by the Insurer to Her Majesty in the event of any material change in or cancellation of coverage. Any such notice received by the Contractor shall be transmitted forthwith to Her Majesty.

PART II
COMMERCIAL GENERAL LIABILITY

CGL 1 Scope of Policy
(01/10/94)

The policy shall be written on a form similar to that known and referred to in the insurance industry as IBC 2100 – Commercial General Liability policy (Occurrence form) and shall provide for limit of liability of not less than $2,000,000 inclusive for Bodily Injury and Property Damage for any one occurrence or series of occurrences arising out of one cause. Legal or defence cost incurred in respect of a claim or claims shall not operate to decrease the limit of liability.

CGL 2 Coverages/Provisions
(01/10/94)

The policy shall include but not necessarily be limited to the following coverages/provisions.

2.1 Liability arising out of or resulting from the ownership, existence, maintenance or use of premises by the Contractor and operations necessary or incidental to the performance of this contract.

2.2 "Broad Form" Property Damage including the loss of use of property.

2.3 Removal or weakening of support of any building or land whether such support be natural or otherwise.

2.4 Elevator liability (including escalators, hoists and similar devices).

2.5 Contractor's Protective Liability

2.6 Contractual and Assumed Liabilities un this contact.

2.7 Completed Operations Liability – The insurance, including all aspects of this Part II of these Insurance Conditions shall continue for a period of at least one (1) year beyond the date of the Departmental Representative's Final Certificate of Completion for the Completed Operations.

2.8 Cross Liability – The Clause shall be written as follows:

Cross Liability – The insurance as is afforded by this policy shall apply in respect to any claim or action brought against any one Insured by any other Insured. The coverage shall apply in the same manner and to the same extent as though a separate policy had been issued to each Insured. The inclusion herein of more than one Insured shall not increase the limit of the Insurer's liability.

2.9 Severability of Interests – The Clause shall be written as follows:

Severability of Interests – This policy, subject to the limits of liability stated herein, shall apply separately to each Insured in the same manner and to the same extent as if a separate policy had been issued to each. The inclusion herein of more than one insured shall not increase the limit of the Insurer's liability.

CGL 3 Additional Exposures
(02/12/03)

The policy shall either include or be endorsed to include the following exposures of hazards if the Work is subject thereto:

3.1 Blasting

3.2 Pile driving and calsson work

3.3 Underpinning

3.4 Risks associated with the activities of the Contractor on an active airport

3.5 Radioactive contamination resulting from the use of commercial isotopes

3.6 Damage to the portion of an existing building beyond that directly associated with an addition, renovation or installation contract.

3.7 Marine risks associated with the contraction of piers, wharves and docks.

CGL 4 Insurance Proceeds
(01/10/94)

Insurance Proceeds from this policy are usually payable directly to a Claimant/Third Party.

CGL 5 Deductible
(02/12/03)

This policy shall be issued with a deductible amount of not more than $10,000 per occurrence applying to Property Damage claims only.

PART III
BUILDER'S RISK – INSTALLATION FLOATER – ALL RISKS

BR 1 Scope of Policy
(01/10/94)

The policy shall be written on an "All Risks" basis granting coverages similar to those provided by the forms known and referred to in the insurance industry as "Builder's Risk Comprehensive Form" or "Installation Floater – All Risks".

BR 2 Property Insured
(01/10/94)

The property insured shall include:

2.1 The Work and all property, equipment and materials intended to become part of the finished Work at the site of the project while awaiting, during and after installation, erection or construction including testing.

2.2 Expenses incurred in the removal from the construction site of debris of the property insured, including demolition of damaged property, de-icing and dewatering, occasioned by loss, destruction or damage to such property and in respect of which insurance is provided by this policy.

BR 3 Insurance Proceeds
(01/10/94)

3.1 Insurance proceeds from this policy are payable in accordance with GC28 of the General Conditions "C" of the contract.

3.2 This policy shall provide that the proceeds thereof are payable to Her Majesty or as the Minister may direct.

3.3 The Contractor shall do such things and execute such documents as are necessary to effect payment of the proceeds.

BR 4 Amount of Insurance
(01/10/94)

The amount of insurance shall not be less than the sum of the contract value plus the declared value (if any) set forth in the contract documents of all material and equipment supplied by Her Majesty at the site of the project to be incorporated into and form part of the finished Work.

BR 5 Deductible
(02/12/03)

The Policy shall be issued with a deductible amount of not more than $10,000.

BR 6 Subrogation
(01/10/94)

The following Clause shall be included in the policy:

"All rights of subrogation or transfer of rights are hereby waived against any corporation, firm, individual or other interest, with respect to which, insurance is provided by this policy".

BR 7 Exclusion Qualifications
(01/10/94)

The policy may be subject to the standard exclusions but the following qualifications shall apply:

7.1 Faulty materials, workmanship or design may be excluded only to the extent of the cost of making good thereof and shall not apply to loss or damage resulting therefrom.

7.2 Loss or damage caused by contamination by radioactive material may be excluded except for loss or damage resulting from commercial isotopes used for industrial measurements, inspection, quality control radiographic or photographic use.

7.3 Use and occupancy of the project or any part of section thereof shall be permitted where such use and occupancy is for the purpose for which the project is intended upon completion.

INSURER'S CERTIFICATE OF INSURANCE

(TO BE COMPLETED BY INSURER (NOT BOKER) AND DELIVERD TO NATIONAL RESEARCH COUNCIL CANADA WITH 30 DAYS FOLLOWING ACCEPTANCE OF TENDER)

CONTRACT

DESCRIPTION OF WORK	CONTRACT NUMBER	AWARD DATE
LOCATION		

INSURER

NAME
ADDRESS

BROKER

NAME
ADDRESS

INSURED

NAME OF CONTRACTOR
ADDRESS

ADDITIONAL INSURED

HER MAJESTY THE QUEEN IN RIGHT OF CANADA AS REPRESENTED BY THE NATIONAL RESEARCH COUNCIL CANADA

THIS DOCUENT CERTIFIES THAT THE FOLLOWING POLICES OF INSURANCE ARE AT PRESENT IN FORCE COVERING ALL OPERATIONS OF THE INSURE IN CONNECTION WITH THE CONTRACT MADE BETWEEN THE NAMED INSURED AND THE NATIONAL RESEARCH COUNCIL CANADA AND IN ACCORDANCE WITH THE INSURANCE CONDITIONS "E"

POLICY					
TYPE	NUMBER	INCEPTION DATE	EXPIRY DATE	LIMITS OF LIABILITY	DEDUCTIBLE
COMMERCIAL GENERAL LIABILITY					
BUILDERS RISK "AL RISKS"					
INSTALLATION FLOATER "ALL RISKS"					

THE INSURER AGREES TO NOTIFY THE NATIONAL RESEARCH COUNCIL CANADA IN WRITING 30 DAYS PRIOR TO ANY MATERIAL CHANGE IN OR CANCELLATION OF ANY POLICY OR COVERAGE SPECIFICALLY RELATED TO THE CONTRACT

NAME OF INSURER'S OFFICER OR AUTHORIZED EMPLOYEE	SIGNATURE	DATE:
		TELEPHONE NUMBER:

ISSUANCE OF THIS CERTIFIATE SHALL NOT LIMIT OR RESTRICT THE RIGHT OF THE NATIONAL RESEARCH COUNCIL CANADA TO REQUEST AT ANY TIME DUPLICATE COPIES OF SAID INSURANCE POLICIES

CS1 Obligation to provide Contract Security

1.1 The Contractor shall, at the Contractor's own expense, provide one or more of the forms of contract security prescribed in CS2.

1.2 The Contractor shall deliver to the Departmental Representative the contract security referred to in CS1.1 within 14 days after the date that the Contractor receives notice that the Contractor's tender or offer was accepted by Her Majesty.

CS2 Prescribed Types and Amounts of Contract Security

2.1 The Contractor shall deliver to the Departmental Representative pursuant to CS1

2.1.1 a performance bond and a labour and material payment bond each in an amount that is equal to not less than 50% of the contract amount referred to in the Articles of Agreement, or

2.1.2 a labour and material payment bond in an amount that is equal to not less than 50% of the contract amount referred to in the Articles of Agreement, and a security deposit in an amount that is equal to

2.1.2.1 not less than 10% of the contract amount referred to in the Articles of Agreement where that amount does not exceed $250,000, or

2.1.2.2 $25,000 plus 5% of the part of the contract amount referred to in the Articles of Agreement that exceeds $250,000, or

2.1.3 a security deposit in an amount prescribed by CS2.12 plus an additional amount that is equal to 10% of the contract amount referred to in the Articles of Agreement.

2.2 A performance bond and a labour and material payment bond referred to in CS2.1 shall be in a form and be issued by a bonding or surety company that is approved by Her Majesty.

2.3 The amount of a security deposit referred to in CS2.1.2 shall not exceed $250,000 regardless of the contract amount referred to in the Articles of Agreement.

2.4 A security deposit referred to in CS2.1.2 and CS2.1.3 shall be in the form of

2.4.1 a bill of exchange made payable to the Receiver General of Canada and certified by an approved financial institution or drawn by an approved financial institution on itself, or

2.4.2 bonds of or unconditionally guaranteed as to principal and interest by the Government of Canada.

2.5 For the purposes of CS2.4

2.5.1 a bill of exchange is an unconditional order in writing signed by the Contractor and addressed to an approved financial institution, requiring the said institution to pay, on demand, at a fixed or determinable future time a sum certain of money to, or to the order

of, the Receiver General for Canada, and

2.5.2 If a bill of exchange is certified by a financial institution other than a chartered bank then it must be accompanied by a letter or stamped certification confirming that the financial institution is in a t least one of the categories referred to in CS2.5.3

2.5.3 an approved financial institution is

2.5.3.1 any corporation or institution that is a member of the Canadian Payments Association,

2.5.3.2 a corporation that accepts deposits that are insured by the Canada Deposit Insurance Corporation or the Régie de l'assurance-dépôts du Québec to the maximum permitted by law,

2.5.3.3 a credit union as defined in paragraph 137(6)(b) of the *Income Tax Act*,

2.5.3.4 a corporation that accepts deposits from the public, if repayment of the deposit is guaranteed by Her Majesty in right of a province, or

2.5.3.5 The Canada Post Corporation.

2.5.4 the bonds referred to in CS2.4.2 shall be

2.5.4.1 made payable to bearer, or

2.5.4.2 accompanied by a duly executed instrument of transfer of the bonds to the Receiver General for Canada in the form prescribed by the Domestic Bonds of Canada Regulations, or

2.5.4.3 registered, as to principal or as to principal and interest in the name of the Receiver General for Canada pursuant to the Domestic Bonds of Canada Regulations, and

2.5.4.4 provided on the basis of their market value current at the date of the contract.

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat
PR 816791
Security Classification / Classification de sécurité UNCLASSIFIED

SECURITY REQUIREMENTS CHECK LIST (SRCL)
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE

1. Originating Government Department or Organization / Ministère ou organisme gouvernemental d'origine: National Research Council (NRC-CNRC)	2. Branch or Directorate / Direction générale ou Direction: ASPM / SAGI
3. a) Subcontract Number / Numéro du contrat de sous-traitance: PR 816791	3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant: For tender

4. Brief Description of Work / Brève description du travail
Project 5398 - M58 Roofing

5. a) Will the supplier require access to Controlled Goods? Le fournisseur aura-t-il accès à des marchandises contrôlées?	☑ No / Non ☐ Yes / Oui
5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations? Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques?	☑ No / Non ☐ Yes / Oui

6. Indicate the type of access required / Indiquer le type d'accès requis

6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS? (Specify the level of access using the chart in Question 7. c) (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c)	☑ No / Non ☐ Yes / Oui
6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé.	☐ No / Non ☑ Yes / Oui
6. c) Is this a commercial courier or delivery requirement with no overnight storage? S'agit-il d'un contrat de messagerie ou de livraison commerciale sans entreposage de nuit?	☑ No / Non ☐ Yes / Oui

7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès

Canada ☑	NATO / OTAN ☐	Foreign / Étranger ☐

7. b) Release restrictions / Restrictions relatives à la diffusion

Canada	NATO / OTAN	Foreign / Étranger
No release restrictions / Aucune restriction relative à la diffusion ☑	All NATO countries / Tous les pays de l'OTAN ☐	No release restrictions / Aucune restriction relative à la diffusion ☐
Not releasable / À ne pas diffuser ☐		
Restricted to: / Limité à : ☐	Restricted to: / Limité à : ☐	Restricted to: / Limité à : ☐
Specify country(ies): / Préciser le(s) pays :	Specify country(ies): / Préciser le(s) pays :	Specify country(ies): / Préciser le(s) pays :

7. c) Level of information / Niveau d'information

Canada	NATO	Foreign / Étranger
PROTECTED A / PROTÉGÉ A ☐	NATO UNCLASSIFIED / NATO NON CLASSIFIÉ ☐	PROTECTED A / PROTÉGÉ A ☐
PROTECTED B / PROTÉGÉ B ☐	NATO RESTRICTED / NATO DIFFUSION RESTREINTE ☐	PROTECTED B / PROTÉGÉ B ☐
PROTECTED C / PROTÉGÉ C ☐	NATO CONFIDENTIAL / NATO CONFIDENTIEL ☐	PROTECTED C / PROTÉGÉ C ☐
CONFIDENTIAL / CONFIDENTIEL ☐	NATO SECRET / NATO SECRET ☐	CONFIDENTIAL / CONFIDENTIEL ☐
SECRET / SECRET ☐	COSMIC TOP SECRET / COSMIC TRÈS SECRET ☐	SECRET / SECRET ☐
TOP SECRET / TRÈS SECRET ☐		TOP SECRET / TRÈS SECRET ☐
TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐		TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐

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PART A *(continued)* / PARTIE A *(suite)*

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets? — ☑ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS?
If Yes, indicate the level of sensitivity:
Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets? — ☑ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate?

Short Title(s) of material / Titre(s) abrégé(s) du matériel :
Document Number / Numéro du document :

PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis

☑ RELIABILITY STATUS COTE DE FIABILITÉ	☐ CONFIDENTIAL CONFIDENTIEL	☐ SECRET SECRET	☐ TOP SECRET TRÈS SECRET
☐ TOP SECRET– SIGINT TRÈS SECRET – SIGINT	☐ NATO CONFIDENTIAL NATO CONFIDENTIEL	☐ NATO SECRET NATO SECRET	☐ COSMIC TOP SECRET COSMIC TRÈS SECRET
☐ SITE ACCESS ACCÈS AUX EMPLACEMENTS			

Special comments:
Commentaires spéciaux : _____

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.
REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

10. b) May unscreened personnel be used for portions of the work? — ☐ No / Non ☑ Yes / Oui
Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail?
If Yes, will unscreened personnel be escorted? — ☐ No / Non ☑ Yes / Oui
Dans l'affirmative, le personnel en question sera-t-il escorté?

PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises? — ☑ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS?

11. b) Will the supplier be required to safeguard COMSEC information or assets? — ☑ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC?

PRODUCTION

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises? — ☑ No / Non ☐ Yes / Oui
Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ?

INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data? — ☑ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS?

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency? — ☑ No / Non ☐ Yes / Oui
Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale?

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PART C - *(continued)* / PARTIE C - *(suite)*

For users completing the form **manually** use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.
Les utilisateurs qui remplissent le formulaire **manuellement** doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form **online** (via the Internet), the summary chart is automatically populated by your responses to previous questions.
Dans le cas des utilisateurs qui remplissent le formulaire **en ligne** (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

Category / Catégorie	PROTECTED / PROTÉGÉ			CLASSIFIED / CLASSIFIÉ			NATO				COMSEC					
	A	B	C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET	NATO RESTRICTED / NATO DIFFUSION RESTREINTE	NATO CONFIDENTIAL / NATO CONFIDENTIEL	NATO SECRET	COSMIC TOP SECRET / COSMIC TRÈS SECRET	PROTECTED / PROTÉGÉ A	PROTECTED / PROTÉGÉ B	PROTECTED / PROTÉGÉ C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET
Information / Assets / Renseignements / Biens																
Production																
IT Media / Support TI																
IT Link / Lien électronique																

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?
La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

☑ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?
La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

☑ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquer qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).

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PART D - AUTHORIZATION / PARTIE D - AUTORISATION

13. Organization Project Authority / Chargé de projet de l'organisme

Name (print) - Nom (en lettres moulées)	Title - Titre	Signature
Isabelle D'Amour-Tanguay	Construction Project Manager	

Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
613-410-3277		isabelle.damour-tanguay@nrc-cnrc.gc.ca	Feb. 19, 2019

14. Organization Security Authority / Responsable de la sécurité de l'organisme

Name (print) - Nom (en lettres moulées)	Title - Titre	Signature
Richard Bramucci	Analyst, Security in Contracting	

Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
613-991-1093		richard.bramucci@nrc-cnrc.gc.ca	2019.02.19

15. Are there additional instructions (e.g. Security Guide, Security Classification Guide) attached?
Des instructions supplémentaires (p. ex. Guide de sécurité, Guide de classification de la sécurité) sont-elles jointes?

☑ No / Non ☐ Yes / Oui

16. Procurement Officer / Agent d'approvisionnement

Name (print) - Nom (en lettres moulées)	Title - Titre	Signature
Alain Leroux	Senior Proc. Officer	

Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date
613 991-9980		alain.leroux@nrc-cnrc.gc.ca	01.03.2019

17. Contracting Security Authority / Autorité contractante en matière de sécurité

Name (print) - Nom (en lettres moulées)	Title - Titre	Signature

Telephone No. - N° de téléphone	Facsimile No. - N° de télécopieur	E-mail address - Adresse courriel	Date