

PART 1 GENERAL

1.1 SCOPE OF WORK

- .1 The services set out in this section cover the ongoing monitoring of roof renovation work for 2016-17 at the John H. Chapman Space Centre in Saint-Hubert.
- .2 The project consists of the complete renovation of the roof basins at P2N3, P4N3, P0N3, P0N5 and the main rotunda, totaling over 1285 square metres of running surface. The work includes, but is not limited to:
 - .1 Dismantling of the lightning rod system;
 - .2 Dismantling of aluminum wall panels, crowning and counter flashing;
 - .3 Removal and cleaning of ballast river stone compound and patio slabs;
 - .4 Demolition of the existing sealing system and construction of a new cover with cold sealing system;
 - .5 Construction details for current drains, vent and equipment;
 - .6 Changes to crowning panels to improve maintenance;
 - .7 Insulation and replacing components.
- .3 Then the project will be completed by securing the access and circulation to the roof for repair and maintenance work, as much for the Departmental Representative as the contractors. This work is for the same basins as the roof renovation.
 - .1 Installation of safe anchorages;
 - .2 Addition of lifelines on new and some existing anchorages;
 - .3 Flow path planning to distance traffic parapets;
 - .4 Various work changes and safety features.
- .4 Refer to plans and specifications for description of complete scope of Work.
- .5 In order to comply with the requirements of the Departmental Representative, the work must be “flameless”.

1.2 RELATED REQUIREMENTS

- .1 Not applicable

1.3 REFERENCES

- .1 American Society of Testing and Materials (ASTM) International
 - .1 ASTM C168, Standard Terminology Relating to Thermal Insulation.
 - .2 ASTM C1153, Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging.
 - .3 ASTM D7186-12, Standard Practice for Quality Assurance Observation of Roof Construction and Repair

- .4 D1079, Terminology Relating to Roofing and Waterproofing
- .5 E631, Terminology of Building Constructions
- .2 Quebec Master Roofers Association (AMCQ)

1.4 DEFINITIONS

- .1 Building science principles: Best practices and construction procedures, methods and materials that have been recommended, developed and tested by the National Research Council Canada, the Canada Mortgage and Housing Corporation or any other applicable recognized organization, to ensure and improve airtightness, moisture resistance and protection against moisture migration to building interior.
- .2 Inspection report: Report prepared daily to review site conditions, progress of the work and workers present on site for quality control and Departmental Representative follow-up.
- .3 Control office: The control office is an independent professional organization that, in accordance with its mandate, typically becomes involved once the project design is complete to ensure that the work is carried out in accordance with the plans and specifications, the manufacturer's specifications and other official data sheets.

1.5 SUBMITTALS

- .1 Submit an inspection report for each site visit, documenting the results of work progress, quality of execution and the specific tests set out in this section.
- .2 The reports shall be corrected and computer typed.
- .3 The report shall include, but shall not be limited to the following information:
 - .1 Name and qualifications of persons in charge of performing analyses, interpreting data and producing reports;
 - .2 Information on the project and the Contractor;
 - .3 Number of workers on site;
 - .4 Number of hours worked;
 - .5 List of specialty contractors on site;
 - .6 Name and qualifications of the foreman;
 - .7 Description and sketch of work progress and materials installed;
 - .8 Environmental conditions during task performance, specifically:
 - .1 Exterior ambient temperature;
 - .2 Sunlight, precipitation and wind conditions;
 - .9 Condition of supports prior to application of waterproofing products:
 - .1 Humidity percentage compared to manufacturer recommendations;
 - .2 Condition and structural quality of supports;
 - .3 Texture, porosity and contaminants that could affect application quality;

- .10 Types of devices and instruments used, including: infrared radiometers, temperature, pressure and wind sensors, video cameras, and cameras and recorders, including information to calibrate this equipment;
- .11 Interpretation of conditions and anomalies observed and indication of probable causes. The recommendations contained in this report describe corrective measures to be taken, and shall be closely monitored by the inspector.
- .12 Quantities of materials covered by a unit price for addition or credit to the Contractor's contract. All actual quantities covered by unit prices identified will be accounted for by the supervisor and adjusted with the quantities estimated in the contract documents.
- .13 Photographic report including at least 10 photos per day, with comments and location.
 - .1 Take only colour photos.
 - .2 The size of the image must exceed 8 megapixels (2448 x 3264 pixels), with 72 dpi of resolution so they can be enlarged as needed.
 - .3 Format: JPEG
- .4 Submit, separately from the inspection reports, a list of deficiencies and work to be completed for provisional acceptance of the waterproofing work. The visit will be planned at the Contractor's request when he or she deems that the work is complete and compliant. The inspection visit shall be planned with the Departmental Representative present.
 - .1 Submit an inspection report listing all work to be completed or corrected for acceptance of the work.
 - .2 Document each item in a photographic report with comments and location.
- .5 At the end of the project, submit, on computer media, all photos, reports and comments produced during the work. Documents shall be organized and produced in PDF format.

1.6 QUALITY ASSURANCE

- .1 Project Authority
 - .1 The project authority shall attend site meetings and assist the site supervisor in the execution of tasks.
- .2 Site Supervisor
 - .1 A single supervisor shall be assigned to quality control throughout the project.

1.7 WORK SCHEDULE

- .1 The work period is estimated at 25 days of waterproofing and insulation work. The inspector's presence shall not be required for flashing work and other facing work.
- .2 Frequency and/or number of site meetings:

- .1 1 project start-up meeting
- .2 3 site meetings

PART 2 PRODUCT

2.1 LABOUR

- .1 The inspection company shall be selected and paid by the Departmental Representative.
- .2 Provide a unit price for each day of monitoring on the site, including all associated costs, and writing, revision and management of documents and of the project. This includes, but is not limited to:
 - .1 10-hour shift to monitor the performance of the work;
 - .2 Travel and living expenses;
 - .3 Management, writing and analysis costs;
 - .4 Project authority fees for daily assistance to supervisor.
- .3 Provide a unit price for each half-day of monitoring in accordance with the same conditions.

2.2 EQUIPMENT (INCLUDED)

- .1 Provide the equipment required to conduct analyses and document the project. This equipment includes, but is not limited to: camera, markers, measuring tape, roofing knife, stem thermometer for bitumen, infrared thermometer, hygrometer, etc.
- .2 Provide personal protective equipment to ensure inspector safety.

PART 3 EXECUTION

3.1 DOCUMENT REVIEW

- .1 Examine drawings and specifications and become familiar with the materials and design details of the roofing system.
- .2 The supervisor shall be present at the preliminary site meeting to establish, prior to the start of the work, compliance of materials with the requirements of the specifications, application methods to be used and the schedule.
- .3 Examine the roof to identify means of access, possible safety risks and heat sources under the roof.

3.2 PRELIMINARY INSPECTION

- .1 Because the control office must conduct an inspection prior to the start of the work, the Contractor shall submit a preliminary inspection request to the control office within a reasonable timeframe. At the time of this preliminary inspection, the control office shall inspect the base or support to receive the roofing materials; slope, uniformity and cleanliness. The office shall also verify and approve, if it deems sufficient, the readiness of related works: walls, parapets, eaves,

downspouts, plumbing vent lines, drains and any other works required in the specifications, in accordance with the requirements in effect.

- .2 If the surfaces meet the requirements of the documents and recommendations set out by manufacturers, the control office shall notify the Contractor that work may begin and continue. In the course of the work, the supervisor shall communicate with the Contractor to ensure his or her presence on the site. For any reason other than weather, the Contractor shall communicate with the inspector within a reasonable timeframe in the event of an extended interruption.

3.3 MONITORING

- .1 During application of roofing materials, the presence of the supervisor from the control office shall be ongoing. If the supervisor must be absent for a valid reason, he or she shall take the means required to ensure that work has been correctly executed upon his or her return, as the supervisor assumes all responsibility for compliance with specification requirements.
- .2 The presence of the supervisor is not required for support cleaning work, including removing excess materials or accumulated snow and/or ice, or drying surfaces.
- .3 Ensure that plans, specifications and manufacturer specifications are complied with so that the waterproofing system meets the performance criteria based on which it was designed. Monitoring is not limited to waterproofing products, but includes all roofing, woodworking and insulation systems and materials involved in the work. Inspection shall ensure that work complies with plans and specifications, and shall involve the following verifications:
 - .1 Nature, thickness, weight and number of membranes and materials;
 - .2 Overlap and watertightness of membrane joints;
 - .3 Construction of columns, control joints and expansion joints;
 - .4 Watertightness of mechanical, electrical and other equipment on roofs;
 - .5 Flow of rainwater to various drains.
- .4 Check the compliance of materials delivered and their storage on site. Describe the products, the product baseline and the quantity delivered to the site.
- .5 Inspect supports before receiving roofing materials: slope, sturdiness, cleanliness, preparation and approval of related works, such as walls, parapets, eaves, downspouts, plumbing vent lines, drains and any other works required.
- .6 Check the preparation of surfaces and repairs required prior to system construction, in accordance with specifications.
- .7 Confirm methods and count fastening systems, number of fasteners, and quantity of adhesives, including installation and spacing diagrams. Check application percentages and membrane overlap.
- .8 In the event of a discrepancy between site conditions and recommendations, immediately contact the Departmental Representative to notify him or her and agree on a solution to resolve the problem.

- .9 Report conflicts, site conditions or problems encountered. Describe responses to correct the situation and the anticipated conclusion.
- .10 Check compliance and performance of the temporary waterproofing installed after each work day and the precautions taken to secure materials and equipment kept on site.
- .11 Count surfaces where interventions have been made. Assess the progress percentage of the work and the number of days remaining to complete the waterproofing work.
- .12 Use a clearly visible grease pencil to mark areas where the presence of moisture is suspected in materials, waterproofing deficiencies or depressions to be repaired. Ensure that corrective work has been completed before covering the system.

3.4 WRITING

- .1 The inspector's role on the site is to qualitatively and quantitatively monitor materials and their installation. The inspector shall verify compliance with plans and specifications, according to the quality level set out, and identify discrepancies with plans and specifications.
- .2 Prepare daily notes and observations with clear and objective wording, using specific terms and supported by visual media (photographs) to show quality control points, keep a project history and enable the Departmental Representative to follow site progress.
- .3 Submit the preliminary report prepared by the site supervisor to the Departmental Representative before noon (12:00 p.m.) the next day.
- .4 Submit the corrected and typed notes to the Departmental Representative within 24 working hours of inspection.

3.5 PROVISIONAL ACCEPTANCE

- .1 When the Contractor has completed the waterproofing work, inspect the work in the presence of the Departmental Representative. Identify deficiencies and work to be completed in a report, including photos.
- .2 The inspection shall be conducted in the presence of the Contractor's representative, in order to identify deficiencies and make minor repairs on site if necessary.

3.6 FINAL ACCEPTANCE

- .1 Once corrective measures have been completed, reanalyze the defective surfaces identified in the report. Conduct a final inspection prior to covering ballast surfaces and metal coverings.
- .2 Issue a certificate confirming the quality of the work and compliance with installation recommendations.

END OF SECTION