ANNEX D

PROJECT BRIEF

1.1 GENERAL

The Project Brief has been drafted to provide proponents with information on the scope of the project and the procedures and services required for fulfilment of the project within the established budget and time frame.

Public Works and Government Services Canada (PWGSC) requires the services of a design/construction team authorized to practise in Quebec to act as general contractor, as well as a multidisciplinary team of subcontractors to carry out the design and construction of this project.

1.2 CONTEXT

The Soils and Crops Research and Development Centre (SCRDC) has two connected cooling systems. Cooling system #1 (Carrier model 30HS160D100 with a capacity of 125 tons) installed in the basement, with two air-cooled liquid chillers on the roof. This system was installed in 1984. Cooling system #2 was installed on the roof in 2002 (capacity 210 tons). At present, system #1 operates from December to April, channeling chilled water to controlled-temperature rooms, system condensers, the air conditioning for the Centre sector and Conviron chambers (growth cabinet rooms), etc.

In summer, system #2 takes over and provides chilled water to the research facilities listed above and to the air conditioning in wings A and B via two ventilation systems (A1 and A2). Alterations have been made to system #2 to enable it to function year-round. Chilled water is channeled to the various equipment through a main chilled water loop.

The condition of system #1 was examined in the spring of 2014, and it was recommended that the chiller and the condensation cooling units on the roof be replaced, since they are in a poor state and have reached the end of their useful life.

Two replacement options have been evaluated:

Option A
Replacement of the existing 125-ton chiller with another of the same capacity, keeping the same operating sequences for the two systems.

Option B
Replacement of the existing 125-ton chiller with a chiller of 210 tons capacity. This option would allow use of both systems independently of the season, would extend the useful life of the chiller in system #2 (roof) and would ensure continuity of the Centre's research operations in the event of a major chiller failure.

Option B has been selected and will be the subject of this call for tenders (both cooling systems to be operational year-round).

1.3 CURRENT CONDITIONS

The existing 125-ton capacity chiller is in the SCRDC's basement, in mechanical room B-009. The two air-cooled chillers are on the roof (three-storey building). The main chiller will need to be dismantled for removal from the building. A crane will be needed to lower the existing air-cooled chillers from the roof and mount the new units there.

System #1 is fitted with a heat recovery loop for pre-heating the water for the building's heating system. This loop will be kept. The heating circuit (water) goes through the chiller's heat recovery mechanism before going to the steam/water exchanger. This arrangement feeds the heating coils of ventilation systems BO-A1 & BO-A2. Before work starts, alterations will be needed to be able to heat the building during the work. To do this, a bypass conduit will need to be installed.

1.4 PROJECT IMPLEMENTATION STRATEGY

1.4.1 TURNKEY DESIGN/CONSTRUCTION STRATEGY

.1 This project requires a turnkey strategy from start to finish of the design, construction and commissioning.

.2 The Design-Builder is responsible for carrying out the project at a fixed price and within the time frame allowed.

.3 The project requires the Design-Builder to provide:

a) complete engineering services from start to finish of the design, construction and commissioning;

b) construction contracting services;

c) a general contractor's licence;

d) identification of the consulting firm and of the individuals assigned to the project.

1.4.2 DESIGN PHASE

.1 The Design-Builder, who will direct and coordinate the work, will engage all design and construction services required to carry out the project;

.2 present all required documents to the competent federal and municipal authorities;

.3 be responsible for effective communication among all consultants on his team and work with the representatives of AAC & PWGSC at every stage of the project.

.4 The Design-Builder and his team of design-build consultants must prepare detailed design and construction documents and submit them to the Departmental representative at the 50%, 99% and 100% completion stages. Review and approval by AAC & PWGSC will be required before proceeding to the next stage.

1.4.3 CONSTRUCTION PHASE

.1 The Design-Builder must carry out the project using best trade practices applicable to this type of project, consistent with applicable standards and with the scope, quality, budget and time frame approved for the project.

.2 The Design-Builder will obtain and pay for the municipal construction permit.

.3 The Design-Builder will produce field reports every two (2) weeks throughout the construction work.

.4 The Design-Builder's team of consultants must clearly demonstrate in the fortnightly field reports submitted that "due diligence" has been exercised, to Canada's benefit, ensuring that the work has been carried out exactly as defined in the Project Brief, contract documents, design

documents and construction drawings and specifications for the project. Change orders must be issued for any variances from the design as approved.

1.4.4 APPLICABLE STANDARDS

The plans and specifications and all work done must comply with the following standards and codes and with all prevailing applicable regulations:

1) National Building Code, current edition
2) Quebec Construction Code, current edition
3) National Plumbing Code of Canada - 2010
4) Canadian Electrical Code, latest version
5) Safety Code for the Construction Industry, chapter S-2.1, r.4
6) Standards of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
7) AHRI 550/590, latest version, Standard for Water Chilling Packages Using the Vapor Compression Cycle
8) CSA B52, latest version: Mechanical Refrigeration Code
9) Environment Canada, SPE 1/RA/2F, Environmental Code of Practice for Atmospheric Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems.

1.5 SUMMARY OF SERVICES

1.5.1 CONTEXT

.1 The Design-Builder will design, construct and commission the project;

.2 ensure that cooling system #1 is fully operational.

.3 The Design-Builder is responsible for all upgrades or new components in cooling system #1 to keep it functional and running.

.4 Design and construction will provide for a turnkey project that meets all the objectives and requirements of the Project Brief.

1.5.2 DESIGN AND SUPERVISION SERVICES

.1 The project includes design services for: dismantling of equipment due for replacement, supply and installation of new components needed for the smooth functioning of the cooling system to which the project applies.

.2 Scope of consultant's duties:

Provide professional engineering services, as described in section 1.5.3 – Professional Services Required, so as to meet all requirements set out in the tender documents.

.3 Site accessibility

Except as otherwise specified, the site is accessible daily from 7:00 am to 11:00 pm.
Access must be organized with the Research Centre's facilities manager.

.5 Documents available

1) Original construction mechanical and electrical plans for the building (1969) – paper version (released on award of contract)

2) Plans for the energy-saving improvement project of 1983 – PDF version (appended)

3) Project plans – Repair of mechanical systems – 2004 –
PDF version appended (DWG released on award of contract)

4) Feasibility study report – Replacement of chiller #1
(125 tons) and components (2014) – PDF version (released on award of contract)

.6 Time frame

A schedule of operations is attached for information purposes only.
The Design-Builder must submit his own schedule based on the stated phases of the project.
The main objective is to complete all the work by March 31, 2016.
The only constraint is to allow five (5) working days for AAC & PWGSC to give their feedback on each design stage (50%, 99%)

Operations	Working days
Design (phase #1)	
Meet with client and survey site	2
Select apparatus	10
Plans 50% complete	20
Feedback from AAC & PWGSC	5
Plans 99% complete	15
Feedback from AAC & PWGSC	5
Construction plans and specifications sealed 100%	2
Sub-total:	59
Supervision of work (phase #2)	

Work	60
Total:	119

1.5.3 PROFESSIONAL SERVICES REQUIRED

.1 Consultant's mandate

Under this mandate, the consultant must proceed as follows:

PHASE I (Selection of apparatus and layout of plans and specifications)

1) Review the available documentation (plans and studies).
2) Survey cooling systems #1 and #2 on site.
3) Select the 210-ton chiller and air-cooled liquid chillers as expeditiously as possible so that the contractor can proceed promptly with the purchase.
4) Prepare the plans and specifications for the chiller in system #1, the air-cooled liquid chillers on the roof, the controls and all components needed for the system's smooth functioning.

The plans must be metric and in A-1 format. The plans must be drawn using AUTOCAD. The specifications may be incorporated with the plans or issued as a separate document. The plans and specifications must be in French.

5) Submit to the Department's Project Authority for feedback a copy in PDF format of the plans and specifications when 50% and 99% complete. Allow five (5) working days for feedback from AAC and PWGSC. On receiving feedback from the departmental Project Authority, the consultant must correct and amend the plans and specifications accordingly.
6) Once all corrections have been entered, send the construction plans and specifications to the Project Authority on paper (2 copies) and in PDF, signed and sealed by a member of the OIQ in good standing.

PHASE II (supervision of work)

1) Services required during construction.

Partial supervision of the work, including the following:

- Approve shop drawings;
- Revise proposed change order prices (final approval by PWGSC) and issue site instructions to contractor;
- Answer technical questions from contractor and solve any problems that may arise in the course of the work;
- Hold site meetings at SCRDC every two weeks, Draft and distribute minutes;
- Carry out site inspections (combined with site meetings).
- Assist contractor when commissioning new HVAC/electrical apparatus;
- List defects;
- Check project-end manuals submitted by contractor;
- Update "as built" plans on Autocad from plans annotated by contractor in the course of the work;

Provide "as built" plans in DWG and PDF format and on paper (2 copies).

.2 Deliverables

PHASE I (Selection of apparatus and design of plans and specifications)

Description	Format

Selection of apparatus	PDF
Plans and specifications 50% complete	PDF
Plans and specifications 99% complete	PDF
Plans and specifications for construction 100%	PDF and paper (2 copies)

PHASE II (Supervision of work)

Description	Format
Minutes of site meetings	PDF
Defect lists	PDF
Provisional acceptance of work	PDF
"As built" plans	DWG, PDF and paper (2 copies)

1.5.4 CONSTRUCTION SERVICES

.1 The Design-Builder manages and delivers all construction work covered by the project, in accordance with the provisions set out in the contract and the Project Brief, and in compliance with the standards referenced in this document.

1.6 SUMMARY OF WORK

1.6.1 GENERAL

.1 Provide complete engineering services from award of contract to commissioning, including the following: project planning, design, selection of apparatus, full on-site examination at construction stages, completion of construction and commissioning.

1.6.2 QUALITY ASSURANCE

.1 Ensure that the Design-Builder team provide full quality assurance and quality management services for design and construction. Implement and demonstrate application of a rigorous quality assurance and value analysis process at all stages of the project.

.2 See that AAC & PWGSC analyse and approve all decisions and measures taken regarding planning, design and construction.

.3 File all correspondence, minutes of meetings and approvals of shop drawings.

.4 Forward documentation to PWGSC regularly at all stages of the project.

.5 Provide site inspection reports prepared by consultants.

Inspection reports must be prepared every two weeks during the project's construction phase. These reports must be submitted to the departmental representative within three working days of the inspection.

1.6.3 SCOPE OF WORK (TURNKEY)

.1 The work comprises, but is not necessarily limited to:

1) In accordance with prevailing standards, dismantling:

a) the 125-ton chiller in mechanical room B-009 (SCRDC basement) and all associated equipment due for replacement;

b) the air-cooled liquid chillers on the roof (2 units) and all associated equipment due for replacement;

c) the glycol/water, chilled water and return pumps (3 units);

d) all piping and insulation that cannot be reused in the new installation.

e) electrical connections that will not be reused;

f) regulation;

g) if the chiller base is not large enough to accommodate the new chiller, demolish it.

2) Purge systems. Return the R-22 type refrigerant to the facilities manager for future use in other equipment.

3) Dispose of all discarded items away from the property and submit a destruction notice if required. See form appended.

4) Supply and install:

a) a new helical rotary chiller with a minimum capacity of 210 tons, using HFC-134a refrigerant, ULC certified and approved AHRI 550/590, of brand Trane (model RTWD), Carrier, York or approved equivalent. Obtain a full charge of refrigerant at the factory. Replace all associated equipment needed for an installation that meets the requirements of the Project Brief and is functional and operational.

b) one or two new air-cooled liquid chillers on the roof, Keeprite, model KFL27 or approved equivalent. If the bases on the roof need to be altered to take the new chillers, engage the services of an architect (alterations to multi-layer roof membrane) or of an engineer (addition of supports on the roof bases). The architect or engineer must prepare sealed plans of the alterations to the roof or of the new supports required. Make the alterations needed to hold the new apparatus.

c) three new pumps, for glycol/water, chilled water and return.

d) all new piping, connections, etc. needed for the optimum functioning of the new installation and their insulation. The placing and dimensions of the required conduits will comply with the recommendations of the cooling equipment manufacturer and of the consulting firm mandated by the contractor.

e) all earthquake-resistant provisions are the responsibility of the installer of the apparatus.

f) all new components required for the functioning of the cooling system.

g) In order to sustain the heat recovery loop (heating system hot water), install a plate heat exchanger.

5) Fill the systems (glycol and treatment products) and test the piping for any leakage.

6) Proceed with electrical work so that all system components are powered and connected in accordance with standards.

Replace all conduits, cables, connections, breakers, starters, sectioners, etc which cannot be reused. Wiring must be copper and housed in EMT conduits of sufficient dimensions. Provide pull wires in all conduits.

7) Proceed with the regulation work required to keep the system running well. Connect existing regulation control points in system #1 to the building management system (Reliable). Existing control points are shown on screen shots and on the chilled water system control diagram in Annex 4. Add the following control points, connect them to the building management system and modify the screens for cooling systems #1 and 2:

a) On the roof chillers, each block of fans must have its control point (confirming when it is on). At present, there are four control points for the fan blocks. Add missing points.

b) Each helix in the new 210-ton chiller must have its own control point to confirm when it is on and read the amperage.

Regulation work must be done by SCRDC's current provider, Les Contrôles A.C. Inc, Montreal or Quebec City division.

8) Carry out balancing and start up the system. When the system is fully functional, to the Department's satisfaction, train AAC maintenance staff on operating the new system. Allow three hours for the training.

9) For moving the apparatus, have a new outer double door installed giving access to mechanical room B-009 through the building's east wall. Fit the opening with two insulated double doors, pre-painted (colour of owner's choice), with galvanized steel frame, insulated aluminum threshold, hinges, closers, handle, astragal, lock with key compatible with the building's key system, floor bolt, sealant, etc). Provide magnetic contacts on doors, to be connected to the building's security/access alarm system. If necessary, move electrical and mechanical components on the inside wall and keep them functional. Perform all required work around doors to ensure a complete and weatherproof finish.
10) Start up the system at the end of the project to be able to corroborate the technical data established in the design and offer a final turnkey product for the following items:

- Chiller
- Air-cooled liquid chillers (2)
- Pumps (3)
- Controls

1.7 QUALITY CONTROL AND ASSURANCE

1.7.1 Conduct rigorous quality assurance examinations and inspections during the design and construction phases.

1.7.2 Have consultants inspect all system components. Inspections will include verification of compliance with specifications, drawings, manufacturer's instructions, application tools and work techniques.

1.7.3 Provide a one-year legal warranty (materials and labour) on all apparatus supplied and installed in connection with this project. The warranty will take effect as of the date of provisional acceptance of the work.

1.7.4 The Design-Builder is responsible for the quality of construction and for ensuring that the design and construction teams comply with best practices in design, construction and safety and conduct themselves professionally during all phases of the project.

1.8 TIME FRAME

1.8.1 PROJECT COMPLETION

.1 The number of working days indicated below constitutes the time frame proposed by AAC and PWGSC.

Operations	Working days
Design (phase #1)	
Meeting with client and survey of site	2
Selection of apparatus	10
Plans 50% complete	20
Feedback from AAC & PWGSC	5
Plans 99% complete	15
Feedback from AAC & PWGSC	5
Plans & specifications for construction 100% sealed	2
Sub-total:	59
Supervision of work (phase #2)	
Work	60
Total:	119

.2 The target date for completion of the work is March 31, 2016.

.3 Draw up a detailed project schedule within 15 days of award of the contract and will update it monthly.

1.9 DELIVERABLES

1.9.1 ACCEPTANCE OF DELIVERABLES

.1 Though AAC and PWGSC acknowledge the Design-Builder's obligation to meet project requirements, AAC and PWGSC are authorized to examine all deliverables and work by virtue of the project completion process.

.2 Obtain the approval of the Department's representative for all project deliverables.

a) Acceptance of documents signifies that according to a general examination of the documents in question, they are deemed to be in compliance with performance requirements.

b) Acceptance in no way releases the Design-Builder from his liability with regard to the work and compliance with the contract.

1.9.1 DESIGN PHASE

.1 Minutes of meetings.

.2 Selection of apparatus: shop drawings of the 210-ton chiller's detailed characteristics and the air-cooled liquid chillers.

.3 Plans and specifications 50% complete.

.4 Plans and specifications 99% complete.

.5 Plans and specifications for construction.

1.9.2 CONSTRUCTION PHASE

.1 Every two weeks, submit site inspection reports and minutes of site meetings drafted by consultants.

.2 Schedule of work in the form of a Gantt table.

.3 Design-Builder's site safety program.

.4 Copy of the municipal building permit.

.5 Copy of start of construction authorized by CSST.

.6 List of subcontractors assigned to the project.

.7 Cost breakdown: engineering, design, supervision, construction by specialty.

.8 Shop drawings and technical data sheets of apparatus for approval (AAC, PWGSC and consultants), then approved versions.

.**9** As needed, change orders for approval (by AAC, PWGSC and consultants), change notices and site instructions from consultants.

.10 Lists of defects prepared by consultants.

.11 Paper and PDF copies of the operating manual. This manual must include:

a) Contact details for the Design-Builder (consultants and contractor) and subcontractors.

b) Approved shop drawings and technical data sheets by specialty. Separate specialties with tabs.

c) Test results.

d) Apparatus commissioning record.

e) User/maintenance manuals for the chiller and air-cooled liquid chillers in French.

f) Warranty

g) "As built" plans revised by consultants in PDF or DWG version on CD and duplicate paper copies.