



**RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:**

**Bid Receiving - PWGSC / Réception des
soumissions - TPSGC**
11 Laurier St. / 11, rue Laurier
Place du Portage, Phase III
Core 0B2 / Noyau 0B2
Gatineau, Québec K1A 0S5
Bid Fax: (819) 997-9776

**REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government
Services Canada**

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

**Proposition aux: Travaux Publics et Services
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Title - Sujet RE-CONFIGURABLE HI GAIN ANTENNA	
Solicitation No. - N° de l'invitation W7714-176223/A	Date 2016-10-14
Client Reference No. - N° de référence du client W7714-176223	
GETS Reference No. - N° de référence de SEAG PW-\$\$HN-464-71729	
File No. - N° de dossier hn464.W7714-176223	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2016-11-23	Time Zone Fuseau horaire Eastern Standard Time EST
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Felix, Juneldan	Buyer Id - Id de l'acheteur hn464
Telephone No. - N° de téléphone (873) 469-3334 ()	FAX No. - N° de FAX (819) 953-4944
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: DEPARTMENT OF NATIONAL DEFENCE BLDG 29 RECEIVING 3701 CARLING AVE OTTAWA Ontario K1A0Z4 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

**Raison sociale et adresse du
fournisseur/de l'entrepreneur**

Issuing Office - Bureau de distribution

Electrical & Electronics Products Division
11 Laurier St./11, rue Laurier
7B3, Place du Portage, Phase III
Gatineau, Québec K1A 0S5

Delivery Required - Livraison exigée See Herein	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date



Item Article	Description	Dest. Code Dest.	Inv. Code Fact.	Qty Qté	U. of I. U. de D.	Unit Price/Prix unitaire FOB/FAM	Destination	Plant/Usine	Delivery Req. Livraison Req.	Del. Offered Liv. offerte
1	Antennas Set Reconfigurable Dual-Polarized High Gain Antennas As per Annex "A"	W7714	W141A	1	Each	\$		XXXXXXXXXXXX	See Herein	

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PART 1 - GENERAL INFORMATION

1.1 Security Requirements

There is no security requirement associated with the requirement.

1.2 Statement of Requirement

The contractor must provide the goods and/or services in accordance with the technical requirements stated in the statement of requirement; Reconfigurable Dual-Polarized High Gain Antennas attached.

1.3 Trade Agreements

The requirement is subject to the provisions of the Agreement on Internal Trade (AIT).

1.4 Debriefings

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days from receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

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PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The [2003](#) (2016-04-04) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of [2003](#), Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: 60 days

Insert: 90 calendar days

2.1.1 SACC Manual Clauses

SACC Reference	Section	Date
A9033T	Financial Capability	2012-07-16
B1000T	Condition of Material	2014-06-26

2.2 Submission of Bids

Bids must be submitted ONLY TO THE BID RECEIVING UNIT by the date, time and place indicated on page 1 of the bid solicitation. Do not send proposal directly to the Contracting Officer. Email proposal not accepted.

PWGSC Bids Receiving Unit
11 Laurier Street
Place du Portage, Phase 3, Core 0B2
Gatineau, Québec, K1A 0S5
Tel.: 819-956-3366

Due to the nature of the bid solicitation, bids transmitted by facsimile to PWGSC will not be accepted.

2.3 Improvement of Requirement during Solicitation Period

Should bidders consider that the specifications or Statement of Work contained in the bid solicitation could be improved technically or technologically, bidders are invited to make suggestions, in writing, to the Contracting Authority named in the bid solicitation. Bidders must clearly outline the suggested improvement as well as the reason for the suggestion. Suggestions that do not restrict the level of competition nor favour a particular bidder will be given consideration provided they are submitted to the Contracting Authority at least seven (7) days before the bid closing date. Canada will have the right to accept or reject any or all suggestions.

2.4 Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than seven (7) days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by Bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated, and the enquiry can be answered to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

2.5 Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the Bidders.

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

Canada requests that Bidders provide their bid in separately bound sections as follows:

Section I: Technical Bid (1 hard copy)

Section II: Financial Bid (1 hard copy)

Section III: Certifications (1 hard copy)

Section IV: Additional Information (1 hard copy)

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that Bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process [Policy on Green Procurement](http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, Bidders should:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I: Technical Bid

In their technical bid, Bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

Section II: Financial Bid

Bidders must submit their financial bid in accordance with the Basis of Payment. The total amount of Applicable Taxes must be shown separately.

3.1.2 Exchange Rate Fluctuation Risk Mitigation

1. The Bidder may request Canada to assume the risks and benefits of exchange rate fluctuations. If the Bidder claims for an exchange rate adjustment, this request must be clearly indicated in the bid at time of bidding. The Bidder must submit form PWGSC-TPSGC 450, Claim for Exchange Rate Adjustments with its bid, indicating the Foreign Currency Component (FCC) in Canadian dollars for each line item for which an exchange rate adjustment is required.
2. The FCC is defined as the portion of the price or rate that will be directly affected by exchange rate fluctuations. The FCC should include all related taxes, duties and other costs paid by the Bidder and which are to be included in the adjustment amount.
3. The total price paid by Canada on each invoice will be adjusted at the time of payment, based on the FCC and the exchange rate fluctuation provision in the contract. The exchange rate adjustment will only be applied where the exchange rate fluctuation is greater than 2% (increase or decrease).
4. At time of bidding, the Bidder must complete columns (1) to (4) on form PWGSC-TPSGC 450, for each line item where they want to invoke the exchange rate fluctuation provision. Where bids are evaluated in Canadian dollars, the dollar values provided in column (3) should also be in Canadian dollars, so that the adjustment amount is in the same currency as the payment.
5. Alternate rates or calculations proposed by the Bidder will not be accepted for the purposes of this exchange rate fluctuation provision.

Section III: Certifications

Bidders must submit the certifications required under Part 5.

Section IV: Additional Information

3.1.3 Delivery Offered

While delivery is requested by 16 weeks after the contract award, Bidders should indicate the best delivery that could be offered in the "Line Item Detail".

Delivery of outline drawings of antenna is required as per section 6.0 of the Statement of requirement within 4 weeks after the contract award date.

3.1.4 Contractor's Representative

Name and telephone number of the person responsible for: (will be inserted at contract)

General enquiries

Name: _____

Telephone: _____

E-mail: _____

Facsimile: _____

Delivery follow-up

Name: _____

Telephone: _____

E-mail: _____

Facsimile: _____

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

You are reminded that this solicitation requires the compliance and/or completion of requirements attached as the Statement of Requirement and forming part of this document.

4.1 Evaluation Procedures

- a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- b) An evaluation team composed of representatives of Canada will evaluate the bids.

4.1.1 Technical Evaluation

All bids must be completed in full and provide all of the information requested in the bid solicitation to enable full and complete evaluation.

4.1.1.1 Mandatory Technical Criteria

The following Mandatory requirements must be submitted with the bid for evaluation

- Technical compliance herein

4.1.2 Financial Evaluation

4.1.2.1 Pricing Basis

The bidder must quote firm unit prices in Canadian dollars, DDP Delivered Duty Paid (destination), Applicable Taxes extra, as applicable. Freight charges to destination and all applicable Custom duties and Excise taxes must be included.

4.2 Basis of Selection

A bid must comply with the requirements of the bid solicitation and meet all mandatory technical evaluation criteria to be declared responsive. The responsive bid with the lowest evaluated price will be recommended for award of a contract.

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PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

5.1 Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

5.1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the *Ineligibility and Suspension Policy* (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide with its bid the required documentation, as applicable, to be given further consideration in the procurement process.

5.2 Certifications Precedent to Contract Award and Additional Information

The certifications and additional information listed below should be submitted with the bid, but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame provided will render the bid non-responsive.

5.2.1 Integrity Provisions – Required Documentation

In accordance with the *Ineligibility and Suspension Policy* (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

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5.2.2 General Environmental Criteria Certification

The Bidder must select and complete one of the following two certification statements.

- A) The Bidder certifies that the Bidder is registered or meets ISO 14001.

Bidders' Authorized Representative Signature

Date

or

- B) The Bidder certifies that the Bidder meets and will continue to meet throughout the duration of the contract, a minimum of four (4) out of six (6) criteria identified in the table below.

The Bidder must indicate which four (4) criteria, as a minimum, are met.

Green Practices within the Bidders' organization	Insert a checkmark for each criterion that is met
Promotes a paperless environment through directives, procedures and/or programs	
All documents are printed double sided and in black and white for day to day business activity unless otherwise specified by your client	
Paper used for day to day business activity has a minimum of 30% recycled content and has a sustainable forestry management certification	
Utilizes environmentally preferable inks and purchase remanufactured ink cartridges or ink cartridges that can be returned to the manufacturer for reuse and recycling for day to day business activity.	
Recycling bins for paper, newsprint, plastic and aluminum containers available and emptied regularly in accordance with local recycling program.	
A minimum of 50% of office equipment has an energy efficient certification.	

Bidders' Authorized Representative Signature

Date

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5.2.3 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the [Employment and Social Development Canada \(ESDC\) - Labour's](http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page?&_ga=1.229006812.1158694905.1413548969) website (http://www.esdc.gc.ca/en/jobs/workplace/human_rights/employment_equity/federal_contractor_program.page?&_ga=1.229006812.1158694905.1413548969).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

PART 6 - RESULTING CONTRACT CLAUSES

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

6.1 Security Requirements

6.1.1 There is no security requirement applicable to this Contract.

6.2 Statement of Requirement

The contractor must provide the goods and/or services in accordance with the technical requirements stated herein.

6.2.3 SACC Manual Clauses

SACC Reference	Section	Date
B1501C	Electrical Equipment	2006-06-16
B7500C	Excess Goods	2006-06-16

6.3 Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

6.3.1 General Conditions

[2010A](#) (2016-04-04), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

6.3.1.1 SACC Manual Clauses

SACC Reference	Section	Date
C2801C	Priority Rating - Canadian Contractors	2014-11-27

6.4 Term of Contract

6.4.1 Delivery Date

All the deliverables must be received on or before _____ (Delivery as offered and as accepted will be inserted at contract award).

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6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Juneldan Felix - Supply Officer
Public Works and Government Services Canada - Acquisitions Branch
Logistics, Electrical, Fuel and Transportation Directorate - "HN" Division
E-mail address: juneldan.felix@pwgsc-tpsgc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

6.5.2 Procurement Authority

The Procurement Authority for the contract is:

Name: **to be inserted by PSPC**
3701 Carling Avenue, Ottawa
Ottawa, Ontario K1A 0K2
Telephone:
E-mail address:

The Procurement Authority is the representative of the department or agency for whom the Work is being carried out under the Contract. The Procurement Authority is responsible for the implementation of tools and processes required for the administration of the Contract. The Contractor may discuss administrative matters identified in the Contract with the Procurement Authority however the Procurement Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of Work can only be made through a contract amendment issued by the Contracting Authority.

6.5.3 Contractor's Representative

Name and telephone number of the person responsible for: (will be inserted at contract)

General enquiries

Name: _____
Telephone: _____ Facsimile: _____
E-mail: _____

Delivery follow-up

Name: _____
Telephone: _____ Facsimile: _____
E-mail: _____

6.6 Payment

6.6.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm unit price specified in the contract. Customs duties are included and Applicable Taxes are extra.

6.6.2 Single Payment

SACC Manual clause [H1000C](#) (2008-05-12) Single Payment

6.6.3 SACC Manual Clauses

SACC Reference	Section	Date
G1005C	Insurance	2016-01-28

6.6.4 Exchange Rate Fluctuation Adjustment

1. The foreign currency component (FCC) is defined as the portion of the price or rate that will be directly affected by exchange rate fluctuation. The FCC should include all related taxes, duties and other costs paid by the Bidder and which are to be included in the adjustment amount.
2. For each line item where a FCC is identified, Canada assumes the risks and benefits for exchange rate fluctuation, as shown in the Basis of Payment. For such items, the exchange rate fluctuation amount is determined in accordance with the provision of this clause.
3. The total price paid by Canada on each invoice will be adjusted at the time of payment, based on the FCC and the exchange rate fluctuation provisions in the contract. The exchange rate adjustment amount will be calculated in accordance with the following formula:
Adjustment = $FCC \times Qty \times (i1 - i0) / i0$
where formula variables correspond to:
FCC: Foreign Currency Component (per unit)
i0: Initial exchange rate (CAN\$ per unit of foreign currency [e.g. US\$1])
i1: exchange rate for adjustments (CAN\$ per unit of foreign currency [e.g. US\$1])
Qty: quantity of units
4. The initial exchange rate is typically set as the noon rate as published by the Bank of Canada on the solicitation closing date.
5. For goods, the exchange rate for adjustment will be the noon rate as published by the Bank of Canada on the date the goods were delivered. For services, the exchange rate for adjustment will be the noon rate on the last business day of the month for which the services were performed. For advance payments, the exchange rate for adjustment will be the noon rate on the date the payment was due. The most recent noon rate will be used for non-business days.
6. The Contractor must indicate the total exchange rate adjustment amount (either upward, downward or no change) as a separate item on each invoice or claim for payment submitted under the Contract. Where an adjustment applies, the Contractor must submit with their invoice form PWGSC-TPSGC 450, Claim for Exchange Rate Adjustments.
7. The exchange rate adjustment will only be applied where the exchange rate fluctuation is greater than 2% (increase or decrease), calculated in accordance with column 8 of form PWGSC-TPSGC 450 (i.e. $[i1 - i0] / i0$).

8. Canada reserves the right to audit any revision to costs and prices under this clause.

6.7 Invoicing Instructions

1. The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.
 - (a) The original and one (1) copy must be forwarded to the consignee.
 - (b) one (1) copy must be forwarded to the following address for certification and payment.
3701 Carling Avenue, Ottawa, ON, K1A 0Z4
Attention: _____ **.to be inserted by PWGSC**
 - (c) One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.
Department of Public Works and Government Services - "HN" Division
Attention: Juneldan.felix@tpsgc-pwgsc.gc.ca

6.8 Certifications

6.8.1 Compliance

The continuous compliance with the certifications provided by the Contractor in its bid and the ongoing cooperation in providing additional information are conditions of the Contract. Certifications are subject to verification by Canada during the entire period of the Contract. If the Contractor does not comply with any certification, fails to provide the additional information, or if it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

6.9 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined by the laws in force in Ontario.

6.10 Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) 2010A (2016-04-04) General Conditions - Goods (Medium Complexity);
- (c) Annex "A" Statement of Requirement;
- (d) the Contractor's bid dated _____ (*date of bid*)

6.11 Defence Contract

SACC Manual clause [A9006C](#) (2012-07-16) Defence Contract

6.12 SACC Manual Clauses

SACC Reference	Section	Date
D5545C	ISO 9001:2008 - Quality Management Systems - Requirements (Quality Assurance Code C)	2010-08-16

6.13 NATO Commercial and Government Entity Code (NCAGE) Traceability

Material supplied for the items specified in this contract is subject to investigation by Canada. Material which can neither be demonstrated by the contractor as having originated directly from the NCAGE specified for the item in this contract, nor as supplied with the specific written permission of this specified NCAGE, are subject to the following action by Canada.

Canada may either:

- terminate the contract for default with respect to that item, return the item to the Contractor at the Contractor's risk and expense, and demand and receive from the Contractor (who shall forthwith so pay) all procurement and other costs incurred by Canada, including any increased costs required for the purpose of expediting production; or
- retain the item, and demand and receive from the Contractor (who shall forthwith so pay) the difference between the Contractor's costs relating to the item, as determined by Canada, and the costs which, in Canada's opinion, the Contractor would have incurred had it obtained and supplied an item which did not differ in any way from that specifically required under the contract.

6.14 SACC Manual Clauses (Delivery)

SACC Reference	Section	Date
D2000C	Marking	2007-11-30
D2001C	Labelling	2007-11-30
D6010C	Palletization	2007-11-30
D9002C	Incomplete Assemblies	2007-11-30

6.15 Shipping Instructions - Delivery at Destination

Goods must be consigned to the destination specified in the Contract and delivered:

Delivered Duty Paid (DDP) to DRDC-Ottawa Inco terms 2000 for shipments from a commercial contractor.

6.16 Preparation for Delivery

The Contractor must prepare items for delivery in accordance with the latest issue of the Canadian Forces Packaging Specification D-LM-008-036/SF-000, DND Minimum Requirements for Manufacturer's Standard Pack.

The Contractor must package in quantities of one (1) per package.

ANNEX "A" STATEMENT OF REQUIREMENT

PURCHASE REQUEST TOOL TRACKING NUMBER: 2016-07959

1. **TITLE:** A Set Reconfigurable Dual-Polarized High Gain Antennas

2. BACKGROUND

A set of dual-polarized antennas is needed for RF/microwave measurement system developing in DRDC. These antennas include:

- Dual-linear polarized antennas, and
- Dual-circular polarized antennas.

This document gives the specifications of these antennas.

3. ACRONYMS

CW	Continuous Wave
DRDC	Defence Research and Development Canada
RF	Radio frequency
SOR	Statement of Requirement
TA	Technical Authority
A > B	A is bigger than B.
A < B	A is less than B.
A >= B	A is bigger than or equal to B.
dBil	dB above isotopic linear
dBic	dB above isotopic circular

4. APPLICABLE DOCUMENTS & REFERENCES

None

5. REQUIREMENTS

A set of antenna should have following capabilities.

5.1 Operation frequency

The frequency range is from 1.5 to 40 GHz, which can be broken into no more than 8 frequency bands. The suggested bands are given in the following table:

1	Band-1 includes frequency from 1.5 to 2.6 GHz.
2	Band-2 includes frequency from 2.6 to 3.95 GHz.
3	Band-3 includes frequency from 3.95 to 5.85 GHz.
4	Band-4 includes frequency from 5.85 to 8.2 GHz.
5	Band-5 includes frequency from 8.0 to 12.4 GHz.
6	Band-6 includes frequency from 12.0 to 18.0 GHz.
7	Band-7 includes frequency from 18.0 to 26.5 GHz.
8	Band-8 includes frequency from 26.5 to 40.0 GHz.

5.2 Size of the antennas

The set of antennas shall include

- a. One antenna with 2 feet in diameter, here after called 2-ft-ant, with a removable antenna radome;
- b. One antenna with 3 feet in diameter, here after called 3-ft-ant, with a removable antenna radome;
- c. One antenna with 4 feet in diameter, here after called 4-ft-ant, with a removable antenna radome;
- d. These x-ft-ant (x = 2, 3 and 4) should work at frequency bands given in section 5.1;
- e. All three antennas shall have identical mounting structure.

5.3 Polarization

- a. These x-ft-ant (x = 2, 3 and 4) shall be configured to a dual-linear polarization antenna, and a dual-circular polarization antenna, but not simultaneously.
- b. These x-ft-ant (x = 2, 3 and 4) do not need operating in different bands simultaneously.
- c. Following antenna pair combinations should be configured (not simultaneously) at frequency bands given in section 5.1.
 - i. One dual-linear 2-ft-ant and one dual-linear 3-ft-ant are configured, or;
 - ii. One dual-linear 2-ft-ant and one dual-linear 4-ft-ant are configured, or;
 - iii. One dual-linear 3-ft-ant and one dual-linear 4-ft-ant are configured, or;
 - iv. One dual-circular 2-ft-ant and one dual-circular 3-ft-ant are configured, or;
 - v. One dual-circular 2-ft-ant and one dual-circular 4-ft-ant are configured, or;
 - vi. One dual-circular 3-ft-ant and one dual-circular 4-ft-ant are configured.

5.4 Antenna input port configurations

The input ports of an antenna shall be as followings

- a. SMA female connectors for the first three bands given in section 5.1.
- b. Waveguide inputs for frequency higher than Band-3 given in section 5.1.
- c. Waveguide to coaxial-connector adapter (female) for frequency higher than band-3 given in section 5.1.

5.5 Additional requirements for dual-linear antennas in following tables

For Frequency Band-1

Frequency (GHz)	Gain (dBil)		
	2-ft-ant	3-ft-ant	4-ft-ant
1.5	> 15	> 20	> 23
2.6	> 20	> 25	> 28

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
1.5	< 23.5	< 15.6	< 11.5
2.6	< 13.9	< 9.2	< 6.9

Antenna	Side lobe level (dB)	Port isolation	On-Axis cross	VSWR (at least)	Can handle CW	Weight (lb.)
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		(dB)	polarization (dB)		power (Watts)	
2-ft-ant	< 13.5	>40	>35	1.5:1	>=100	< 18
3-ft-ant	< 15.0	>40	>35	1.5:1	>=100	< 28
4-ft-ant	< 16.0	>40	>35	1.5:1	>=100	< 45

For Frequency Band-2

Frequency (GHz)	Gain (dBil)		
	2-ft-ant	3-ft-ant	4-ft-ant
2.60	> 20	> 25	> 28
3.95	> 23	> 28	> 31

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
2.60	< 13.9	< 9.2	< 6.9
3.95	< 9.3	< 6.2	< 4.6

Antenna	Side lobe level (dB)	Port isolation (dB)	On-Axis cross polarization (dB)	VSWR (at least)	Can handle CW power (Watts)	Weight (lb.)
2-ft-ant	< 13.5	>40	>35	1.5:1	>=50	< 18
3-ft-ant	< 15.0	>40	>35	1.5:1	>=50	< 28
4-ft-ant	< 16.0	>40	>35	1.5:1	>=50	< 45

For Frequency Band-3

Frequency (GHz)	Gain (dBil)		
	2-ft-ant	3-ft-ant	4-ft-ant
3.95	> 23	> 28	> 31
5.85	> 27	> 32	> 35

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
3.95	< 9.3	< 6.2	< 4.6
5.85	< 6.3	< 4.2	< 3.0

Antenna	Side lobe level (dB)	Port isolation	On-Axis cross	VSWR (at least)	Can handle CW	Weight (lb.)
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		(dB)	polarization (dB)		power (Watts)	
2-ft-ant	< 13.5	>40	>35	1.5:1	>=25	< 18
3-ft-ant	< 15.0	>40	>35	1.5:1	>=25	< 28
4-ft-ant	< 16.0	>40	>35	1.5:1	>=25	< 45

For Frequency Band-4

Frequency (GHz)	Gain (dBil)		
	2-ft-ant	3-ft-ant	4-ft-ant
5.85	> 27	> 32	> 35
8.20	> 29	> 34	> 36

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
5.85	< 6.3	< 4.2	< 3.0
8.20	< 4.4	< 2.9	< 2.2

Antenna	Side lobe level (dB)	Port isolation (dB)	On-Axis cross polarization (dB)	VSWR (at least)	Can handle Peak power (kW)	Weight (lb.)
2-ft-ant	< 13.5	>40	>35	1.5:1	>=14	< 18
3-ft-ant	< 15.0	>40	>35	1.5:1	>=14	< 28
4-ft-ant	< 16.0	>40	>35	1.5:1	>=14	< 45

For Frequency Band-5

Frequency (GHz)	Gain (dBil)		
	2-ft-ant	3-ft-ant	4-ft-ant
8.0	> 29	> 34	> 36
12.4	> 32	> 37	> 40

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
8.0	< 4.4	< 2.9	< 2.2
12.4	< 3.3	< 2.0	< 1.5

Antenna	Side lobe level (dB)	Port isolation	On-Axis cross	VSWR (at least)	Can handle	Weight (lb.)
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		(dB)	polarization (dB)		Peak power (kW)	
2-ft-ant	< 13.5	>40	>35	1.5:1	>=5	< 18
3-ft-ant	< 15.0	>40	>35	1.5:1	>=5	< 28
4-ft-ant	< 16.0	>40	>35	1.5:1	>=5	< 45

For Frequency Band-6

Frequency (GHz)	Gain (dBil)		
	2-ft-ant	3-ft-ant	4-ft-ant
12	> 32	> 37	> 40
18	> 35	> 40	> 43

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
12	< 3.0	< 2.0	< 1.5
18	< 2.3	< 1.4	< 1.1

Antenna	Side lobe level (dB)	Port isolation (dB)	On-Axis cross polarization (dB)	VSWR (at least)	Can handle Peak power (kW)	Weight (lb.)
2-ft-ant	< 13.5	>40	>35	1.5:1	>=3	< 18
3-ft-ant	< 15.0	>40	>35	1.5:1	>=3	< 28
4-ft-ant	< 16.0	>40	>35	1.5:1	>=3	< 45

For Frequency Band-7

Frequency (GHz)	Gain (dBil)		
	2-ft-ant	3-ft-ant	4-ft-ant
18.0	> 35	> 40	> 43
26.5	> 39	> 44	> 47

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
18.0	< 2.3	< 1.4	< 1.1
26.5	< 1.4	< 1.0	< 0.7

Antenna	Side lobe level (dB)	Port isolation	On-Axis cross	VSWR (at least)	Can handle	Weight (lb.)
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		(dB)	polarization (dB)		Peak power (kW)	
2-ft-ant	< 13.5	>40	>35	1.5:1	>=1	< 18
3-ft-ant	< 15.0	>40	>35	1.5:1	>=1	< 28
4-ft-ant	< 15.0	>40	>35	1.5:1	>=1	< 45

For Frequency Band-8

Frequency (GHz)	Gain (dBil)		
	2-ft-ant	3-ft-ant	4-ft-ant
26.5	> 39	> 44	> 47
40.0	> 42	> 47	> 50

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
18.0	< 1.4	< 1.0	< 0.7
40.0	< 1.0	< 0.6	< 0.5

Antenna	Side lobe level (dB)	Port isolation (dB)	On-Axis cross polarization (dB)	VSWR (at least)	Can handle Peak power (kW)	Weight (lb.)
2-ft-ant	< 13.0	>40	>35	1.5:1	>=0.5	< 18
3-ft-ant	< 14.0	>40	>35	1.5:1	>=0.5	< 28
4-ft-ant	< 15.0	>40	>35	1.5:1	>=0.5	< 45

5.6 Additional requirements for dual-circular antennas in following tables

For Frequency Band-1

Frequency (GHz)	Gain (dBic)		
	2-ft-ant	3-ft-ant	4-ft-ant
1.5	> 15	> 20	> 23
2.6	> 20	> 25	> 28

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
1.5	< 23.5	< 15.6	< 11.5
2.6	< 13.9	< 9.2	< 6.9

Antenna	Side lobe level (dB)	Port isolation	On-Axis Axial Ratio	VSWR (at least)	Can handle CW power	Weight (lb.)

		(dB)	(dB)		(Watts)	
2-ft-ant	< 14.0	>18	1.5	1.5:1	>=50	< 18
3-ft-ant	< 16.0	>18	1.5	1.5:1	>=50	< 28
4-ft-ant	< 17.0	>18	1.5	1.5:1	>=50	< 45

For Frequency Band-2

Frequency (GHz)	Gain (dBic)		
	2-ft-ant	3-ft-ant	4-ft-ant
2.60	> 20	> 25	> 28
3.95	> 23	> 28	> 31

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
2.60	< 13.9	< 9.2	< 6.9
3.95	< 9.3	< 6.2	< 4.6

Antenna	Side lobe level (dB)	Port isolation (dB)	On-Axis Axial Ratio (dB)	VSWR (at least)	Can handle CW power (Watts)	Weight (lb.)
2-ft-ant	< 14.0	>18	1.5	1.5:1	>=50	< 18
3-ft-ant	< 16.0	>18	1.5	1.5:1	>=50	< 28
4-ft-ant	< 17.0	>18	1.5	1.5:1	>=50	< 45

For Frequency Band-3

Frequency (GHz)	Gain (dBic)		
	2-ft-ant	3-ft-ant	4-ft-ant
3.95	> 23	> 28	> 31
5.85	> 27	> 32	> 35

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
3.95	< 9.3	< 6.2	< 4.6
5.85	< 6.3	< 4.2	< 3.0

Antenna	Side lobe level (dB)	Port isolation	On-Axis Axial Ratio	VSWR (at least)	Can handle CW power	Weight (lb.)
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		(dB)	(dB)		(Watts)	
2-ft-ant	< 14.0	>18	1.5	1.5:1	>=25	< 18
3-ft-ant	< 16.0	>18	1.5	1.5:1	>=25	< 28
4-ft-ant	< 17.0	>18	1.5	1.5:1	>=25	< 45

For Frequency Band-4

Frequency (GHz)	Gain (dBic)		
	2-ft-ant	3-ft-ant	4-ft-ant
5.85	> 27	> 32	> 35
8.20	> 29	> 34	> 36

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
5.85	< 6.3	< 4.2	< 3.0
8.20	< 4.4	< 2.9	< 2.2

Antenna	Side lobe level (dB)	Port isolation (dB)	On-Axis Axial Ratio (dB)	VSWR (at least)	Can handle Peak power (kW)	Weight (lb.)
2-ft-ant	< 14.0	>18	1.5	1.5:1	>=14	< 18
3-ft-ant	< 16.0	>18	1.5	1.5:1	>=14	< 28
4-ft-ant	< 17.0	>18	1.5	1.5:1	>=14	< 45

For Frequency Band-5

Frequency (GHz)	Gain (dBic)		
	2-ft-ant	3-ft-ant	4-ft-ant
8.0	> 29	> 34	> 36
12.4	> 32	> 37	> 40

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
8.0	< 4.4	< 2.9	< 2.2
12.4	< 3.3	< 2.0	< 1.5

Antenna	Side lobe level (dB)	Port isolation (dB)	On-Axis Axial Ratio (dB)	VSWR (at least)	Can handle Peak power (kW)	Weight (lb.)
2-ft-ant	< 14.0	>18	1.5	1.5:1	>=5	< 18
3-ft-ant	< 16.0	>18	1.5	1.5:1	>=5	< 28
4-ft-ant	< 17.0	>18	1.5	1.5:1	>=5	< 45

For Frequency Band-6

Frequency (GHz)	Gain (dBic)		
	2-ft-ant	3-ft-ant	4-ft-ant
12	> 32	> 37	> 40
18	> 35	> 40	> 43

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
12	< 3.0	< 2.0	< 1.5
18	< 2.3	< 1.4	< 1.1

Antenna	Side lobe level (dB)	Port isolation (dB)	On-Axis Axial Ratio (dB)	VSWR (at least)	Can handle Peak power (kW)	Weight (lb.)
2-ft-ant	< 14.0	>18	1.5	1.5:1	>=3	< 18
3-ft-ant	< 16.0	>18	1.5	1.5:1	>=3	< 28
4-ft-ant	< 17.0	>18	1.5	1.5:1	>=3	< 45

For Frequency Band-7

Frequency (GHz)	Gain (dBic)		
	2-ft-ant	3-ft-ant	4-ft-ant
18.0	> 35	> 40	> 43
26.5	> 39	> 44	> 47

Frequency (GHz)	3-dB beamwidth (degrees)		
	2-ft-ant	3-ft-ant	4-ft-ant
18.0	< 2.3	< 1.4	< 1.1
26.5	< 1.4	< 1.0	< 0.7

Antenna	Side lobe level (dB)	Port isolation (dB)	On-Axis Axial Ratio (dB)	VSWR (at least)	Can handle Peak power (kW)	Weight (lb.)
2-ft-ant	< 14.0	>18	1.5	1.5:1	>=1	< 18
3-ft-ant	< 16.0	>18	1.5	1.5:1	>=1	< 28
4-ft-ant	< 16.0	>18	1.5	1.5:1	>=1	< 45

For Frequency Band-8

Frequency (GHz)	Gain (dBic)		
	2-ft-ant	3-ft-ant	4-ft-ant
26.5	> 39	> 44	> 47
40.0	> 42	> 47	> 50

Frequency (GHz)	3-dB beamwidth (degrees)

	2-ft-ant	3-ft-ant	4-ft-ant
18.0	< 1.4	< 1.0	< 0.7
40.0	< 1.0	< 0.6	< 0.5

Antenna	Side lobe level (dB)	Port isolation (dB)	On-Axis Axial Ratio (dB)	VSWR (at least)	Can handle Peak power (kW)	Weight (lb.)
2-ft-ant	< 13.0	>18	1.5	1.5:1	>=0.5	< 18
3-ft-ant	< 15.0	>18	1.5	1.5:1	>=0.5	< 28
4-ft-ant	< 16.0	>18	1.5	1.5:1	>=0.5	< 45

6. DELIVERABLES

6.0 The design of antenna mounting structure, waveguide and/or cable feed structure, and antenna outlines for Bands 1-8 shall be delivered within the first 4 weeks after contract issued. The format should be in SAT for solid model. This delivery shall be a DVD.

6.1 A set of antenna hardware as described in section 5

6.2 Only one set of measurement data is required, (following x-ft = 2-ft, 3-ft and 4-ft) for each band:

- a. Dual-linear x-ft-ant 2-port s-parameters (only absolute value) in the frequency band with frequency step at least 0.1 GHz
- b. Dual-linear x-ft-ant on-axis cross-polarization at one frequency point in the frequency band
- c. Dual-linear x-ft-ant Vertical-polarization antenna pattern at three frequency points for 360 degrees with enough angle resolution to represent main-beam
- d. Dual-linear x-ft-ant Horizontal-polarization antenna pattern at another three frequency points for 360 degrees with enough angle resolution to represent main-beam
- e. Dual-circular x-ft-ant 2-port s-parameters (only absolute value) in the frequency band with frequency step at least 0.1 GHz
- f. Dual-circular x-ft-ant on-axis axial ratio at one frequency point in the frequency band
- g. Dual-circular x-ft-ant Right-hand-polarization antenna pattern at three frequency points for 360 degrees with enough angle resolution to represent main-beam
- h. Dual-circular x-ft-ant left-hand-polarization antenna pattern at another three frequency points for 360 degrees with enough angle resolution to represent main-beam

6.3 All measured data shall be in .csv files.

7. DATE OF DELIVERY

- 1. within 4 weeks after the contract issued, to deliver outline drawings of antenna required in section 6.0
- 2. within 16 weeks after the contract issued, to deliver all the antenna hardware

8. LANGUAGE OF WORK

English

Solicitation No. - N° de l'invitation
W7714-176223
Client Ref. No. - N° de réf. du client
W7714-176223

Amd. No. - N° de la modif.
File No. - N° du dossier
hn464W7714-176223

Buyer ID - Id de l'acheteur
HN464
CCC No./N° CCC - FMS No./N° VME

9. DELIVERY LOCATION

Defence Research and Development Canada – Ottawa Research Centre
Building 29
3701 Carling Av
Ottawa, ON
K1A 0Z4
Canada

10. TRAVEL

Not required

11. MEETINGS

Not required

12. GOVERNMENT SUPPLIED MATERIAL (GSM)

None

13. GOVERNMENT FURNISHED EQUIPMENT (GFE)

None

14. SPECIAL CONSIDERATIONS

None

15. SECURITY

Not required

16. INTELLECTUAL PROPERTY (IP) OWNERSHIP

- Not applicable
- Canada to Own Intellectual Property Rights in Foreground Information
- Contractor to Own Intellectual Property Rights in Foreground Information.

17. CONTROLLED GOODS

- Not applicable
- Applicable