



RETURN BIDS TO:

**RETOURNER LES
SOUSSIONS À :**

NRC.BidReceiving-
ReceptiondesSoumissions.CNRC@nrc-cnrc.gc.ca

**REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITIONS**

Proposal To: National Research Council Canada

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

Proposition au : Conseil national de recherches Canada

Nous offrons par la présente de vendre à Sa Majesté le Roi 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-annexées, au(x) prix indiqué(s).

Instructions : See Herein

Instructions: Voir aux présentes
Comments - Commentaires

Issuing Office – Bureau de distribution
National Research Council Canada
Conseil national de recherches Canada

Title – Sujet SPIDERS OFF-AXIS ELLISOID (OAE) & GPI CAL2.0 OFF-AXIS PARABOLAR (OAP) MIRRORS	
Solicitation No. – N° de l'invitation 23-58221/B	Date June 7, 2024
Solicitation Closes – L'invitation prend fin at – à 02 :00 PM on – le June 24, 2024	Time Zone Fuseau horaire EDT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: X	
Address Inquiries to : - Adresser toutes questions à: Wendy Semegen	
Email address – l'adresse courriel : Wendy.Semegen@nrc-cnrc.gc.ca	
Destination – of Goods, Services, and Construction: Destination – des biens, services et construction :	
National Research Council Canada Victoria, British Columbia V9E 2E7	
Vendor/firm Name and address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Facsimile No. – N° de télécopieur Telephone No. – N° de téléphone	
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



Reissue of Bid Solicitation. This bid solicitation cancels and supersedes previous bid solicitation number 23-58221, dated 2024-02-22 with a closing of 2024-03-28 at 14:00 EDT. A debriefing or feedback session will be provided upon request to bidders who bid on the previous solicitation.

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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

To provide Spiders Off-Axis Ellipsoid (OAE) & Gpi Cal2.0 Off-Axis Paraola (OAP) Mirrors in accordance with the detailed Statement of Requirement attached as Annex "A".

The two OAE mirrors are required for the Subaru telescope Pathfinder Instrument for Detecting Exoplanets and Retrieving Spectra (SPIDERS) project, while the one OAP mirror is required for upgrading the CAL system of the Gemini telescope Planet Imager instrument (GPI).

1.3 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.



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://canadabuys.canada.ca/en/how-procurement-works/policies-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<https://canadabuys.canada.ca/en/how-procurement-works/policies-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

You are invited to submit one electronic Technical Bid and one electronic Financial Bid in two separate attachments to fulfil the following requirement forming part of this Request for Proposal. One attachment must be clearly marked 'Technical Bid' and the other attachment must be marked 'Financial Bid'. All financial information must be fully contained in the Financial Bid, and only in the Financial Bid. Bidders who provide financial information in the technical bid will be disqualified. All Bids should include the front page of this RFP duly completed.

2010A (2022-12-01), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

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.

Proposals submitted must be valid for not less than sixty (60) calendar days from the closing date of the RFP.

2.1.1 It is the Bidder's responsibility to:

- (a) return a signed copy of the bid solicitation, duly completed, IN THE FORMAT REQUESTED;
- (b) direct its bid ONLY to the Bid Receiving address specified under 2.3 Submission of Bids;
- (c) ensure that the Bidder's name, the bid solicitation reference number, and bid solicitation closing date and time are clearly visible;
- (d) provide a comprehensive and sufficiently detailed bid, including all requested pricing details, that will permit a complete evaluation in accordance with the criteria set out in the bid solicitation.

Timely and correct transmission of bids to the specified bid email address is the sole responsibility of the Bidder. The National Research Council Canada (NRC) will not assume or have transferred to it those responsibilities. All risks and consequences of incorrect transmission of bids is the responsibility of the Bidder.

2.1.2 Bids may be accepted in whole or in part. The lowest or any bid will not necessarily be accepted. In the case of error in the extension of prices, the unit price will govern. NRC may enter into contract without negotiation.

2.1.3 While NRC may enter into contract without negotiation, Canada reserves the right to negotiate with bidders on any procurement.

2.1.4 Notwithstanding the bid validity period stipulated in this solicitation, Canada reserves the right to seek an extension from all responsive bidders, within a minimum of three (3) days prior to the end of such period. Bidders shall have the option to either accept or reject the extension.



2.1.5 If the extension referred to above is accepted, in writing, by all responsive bidders, Canada will continue with the evaluation of the bids and its approval processes.

2.1.6 If the extension referred to above is not accepted, in writing, by all responsive bidders, Canada will, at its sole discretion, either continue to evaluate the bids of those who have accepted the extension and seek the necessary approvals; or cancel the solicitation; or cancel and reissue the solicitation.

2.2 Condition of Material – Bid

Material supplied must be new and conform to the latest issue of the applicable drawing, specification and/or part number that is in effect on the bid solicitation closing date.

2.3 Submission of Bids

Bids must be submitted **only electronically** to the National Research Council Canada (NRC) Bid Receiving Unit, no later than 14:00 EDT (NRC's Server Time), June 24, 2024, to the following NRC email address:

NRC.BidReceiving-ReceptiondesSoumissions.CNRC@nrc-cnrc.gc.ca

The NRC has restrictions on incoming e-mail messages. **The maximum e-mail message size including all file attachments must not exceed 10MB.** Zip files or links to bid documents will not be accepted. Incoming e-mail messages exceeding the maximum file size and/or containing zip file attachments will be blocked from entering the NRC e-mail system. A bid transmitted by e-mail that gets blocked by the NRC e-mail system will be considered not received.

Bids must **not** be sent directly to the Contracting Authority.

All submitted bids become the property of NRC.

Due to the nature of the bid solicitation, hard copy bids (paper or soft copies on media) and bids transmitted by facsimile to NRC will not be accepted.

2.4 Late Bids

All risks and consequences of incorrect delivery of electronic bids are the responsibility of the Bidder. The National Research Council Canada will not be responsible for late bids received at destination after the closing date and time, even if it was submitted before. Electronic bids received after the indicated closing time based on NRC servers' received time will be irrevocably rejected. Bidders are urged to send their proposal in sufficient time, in advance of the closing time to reduce any technical issues. The National Research Council Canada will not be held responsible for bids sent before closing time but received by the NRC servers after the closing time.

2.5 Enquiries - Bid Solicitation

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

To ensure the equality of information among Bidders, responses to general enquiries will be made available to all bidders unless such publications would reveal proprietary information. The bidder who initiates the question will not be identified. Technical questions that are considered proprietary by the bidder must be clearly identified. NRC will respond individually to the bidder if it considers the questions proprietary. If NRC does not consider the question proprietary, the bidder submitting it will be allowed to



withdraw the question, or have the question and answer made available through the Open Bidding System (OBS) to all bidders.

Bidders who attempt to obtain information regarding any aspect of this RFP during the solicitation period through any NRC contacts other than the Contracting Authority identified herein, may be disqualified (for that reason alone).

It is the responsibility of the Bidder to obtain clarification of the requirement contained herein, if necessary, prior to submitting its proposal. The Bidder must have written confirmation from the Contracting Authority for any changes, alterations, etc., concerning this RFP.

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.

2.6 Applicable Laws

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

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.

2.7 Bid Challenge and Recourse Mechanisms

- (a) Several mechanisms are available to potential suppliers to challenge aspects of the procurement process up to and including contract award.
- (b) Canada encourages suppliers to first bring their concerns to the attention of the Contracting Authority. Canada's [Buy and Sell](#) website, under the heading "[Bid Challenge and Recourse Mechanisms](#)" contains information on potential complaint bodies such as:
 - Office of the Procurement Ombudsman (OPO)
 - Canadian International Trade Tribunal (CITT)
- (c) Suppliers should note that there are **strict deadlines** for filing complaints, and the time periods vary depending on the complaint body in question. Suppliers should therefore act quickly when they want to challenge any aspect of the procurement process.



PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

Canada requests that the Bidder submits its bid in separate attachment sections (when applicable) as follows:

Section I: Technical Bid

Section II: Financial Bid (Prices must appear in the Financial Bid only. No prices must be indicated in any other section of the bid.)

Section III: Certifications

There shall be no payment by the National Research Council for costs incurred in the preparation and submission of proposals in response to this request. No payment shall be made for costs incurred for clarification(s) and/or demonstration(s) that may be required by NRC. The National Research Council reserves the right to reject any or all proposals submitted, or to accept any proposal in whole or in part without negotiation. A contract will not necessarily be issued as a result of this competition. NRC reserves the right to amend, cancel or reissue this requirement at any time.

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](https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573) (<https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573>). To assist Canada in reaching its objectives, bidders should:

- 1) Include all environmental certification(s) relevant to your organization (e.g., ISO 14001, Leadership in Energy and Environmental Design (LEED), Carbon Disclosure Project, etc.)
- 2) Include all environmental certification(s) or Environmental Product Declaration(s) (EPD) specific to your product/service (e.g., Forest Stewardship Council (FSC), ENERGYSTAR, etc.)

Canada is committed to greening its supply chain. Environmentally preferable goods and services are those that have a lesser or reduced impact on the environment over the life cycle of the good or service, when compared with competing goods or services serving the same purpose. Environmental performance considerations include, among other things: the reduction of greenhouse gas emissions and air contaminants; improved energy and water efficiency; reduced waste and support reuse and recycling; the use of renewable resources; reduced hazardous waste; and reduced toxic and hazardous substances. In accordance with the [Policy on Green Procurement](https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573) (<https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32573>), for this solicitation:

- Bidders are encouraged to offer or suggest green solutions whenever possible.
- Bidders are requested to provide all correspondence including (but not limited to) documents, reports and invoices in electronic format unless otherwise specified by the Contracting Authority or Project Authority, thereby reducing printed material.
- Bidders should recycle (shred) unneeded copies of non-classified/secure documents (taking into consideration the Security Requirements).
- Product components used in performing the services should be recyclable and/or reusable, whenever possible.
- Bidders are encouraged to offer goods and/or services certified to a reputable eco-label.
- Bidders should use equipment that has high energy efficiency or produces low air emissions.
- Bidders are encouraged to offer environmentally preferred products which supports a sustainable environment for nature and wildlife.
- Bidders are encouraged to offer environmentally preferred products which ensure the comfort and air quality of building occupants.



Bidders are encouraged to consult the following websites:
<https://www.tpsgc-pwgsc.gc.ca/app-acq/ae-gp/index-eng.html>
<https://www.tpsgc-pwgsc.gc.ca/app-acq/ae-gp/rle-qlr-eng.html>

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

- (a) **Mandatory Technical Evaluation Criteria:** the table must be completed fully and with relevant details. All external information from bidder's websites or brochures will not be considered during the evaluation if they are not included in the technical bid. Any relevant information from these sources must be included in the technical bid as supporting documentation.

Section II: Financial Bid

- (a) **Pricing:** Bidders must submit their financial bid in accordance with the Basis of Payment including Annex B – Basis of Payment. The applicable taxes must be indicated separately.
- (b) **Blank Prices:** Bidders are requested to insert "\$0.00" for any item for which it does not intend to charge or for items that are already included in other prices set out in the tables. If the Bidder leaves any price blank, Canada will treat the price as "\$0.00" for evaluation purposes and may request that the Bidder confirm that the price is, in fact, \$0.00. No bidder will be permitted to add or change a price as part of this confirmation. Any bidder who does not confirm that the price for a blank item is \$0.00 will be declared non-responsive.

3.1.1 Electronic Payment of Invoices – Bid

Payments from the National Research Council Canada (NRC) are made by electronic payment. Direct deposit payments will be made in Canadian dollars and can only be deposited into Canadian bank accounts.

Only bank accounts outside of Canada are eligible to enroll as a Wire transfer payment method.

3.1.2 Exchange Rate Fluctuation

The requirement does not offer exchange rate fluctuation risk mitigation. Requests for exchange rate fluctuation risk mitigation will not be considered. All bids including such provision will render the bid non-responsive.

Section III: Certifications

Bidders must submit the certifications and additional information required under Part 5.



PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION

4.1 Evaluation Procedures

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

4.1.1 Technical Evaluation

Proposals will be assessed in accordance with the mandatory evaluation below. Bidders shall provide a detailed response to each criterion. NRC reserves the right to verify any and all information provided by the bidder in their proposal.

4.1.1.1 Mandatory Technical Evaluation Criteria

The following requirements are the mandatory technical evaluation criteria which will be evaluated during the Bid Evaluation. In addition, the Contractor will be required to meet all of the mandatory technical requirements at the time of bid closing and for the duration of the Contract.

Bidders are requested to cross reference the mandatory technical criteria in a concise format by using page, paragraph(s) & sub-paragraphs as applicable to their supporting technical documentation.

Bidders must demonstrate their compliance with all of the following mandatory technical evaluation criteria by providing information and describing in detail how the requirement is met or addressed for each criterion. Simply repeating the statement contained in the solicitation is not sufficient:

ITEM	CRITERIA	REQUIRED SUBSTANTIATION Bidder <u>must</u> indicate how they meet the performance specification by recording this information in this column	REFERENCE TO SUBSTANTIATION IN THE TECHNICAL BID. In this column, Bidders <u>must</u> cross-reference where this performance specification is indicated in their supporting documents
M1	The Bidder must demonstrate that they have been in business for over five (5) years by the closing date of the Request for Proposal. The Bidder must provide a copy of their business account list notification provided by Canada Revenue Agency or the certificate of registration or incorporation.		
M2	The Bidder must provide documentation of previous projects that showcase their capability/ proficiency in manufacturing aspherical optics with at least two examples per the following specifications:		



	<ul style="list-style-type: none"> • Surface quality equal to or better than 40/20 Scratch/Dig • Irregularity equal to or less than $\lambda/20$ PTV @633nm • Surface roughness should equal to or less than 0.5 nm rms <p>For each project, it is acceptable if all specifications are not met simultaneously</p>		
<p>M3</p>	<p>The bidder must provide a test procedure which includes a detailed description of the metrology techniques and methodologies for verifying the following key parameters of an off-axis aspherical mirror:</p> <ul style="list-style-type: none"> • As-built Radius of Curvature • Off-Axis Distance errors in X and Y • Peak-Valley and Root Mean Squared amplitudes for surface irregularities, before and after spatial filtering, over the full clear aperture • Scratch-Dig • Surface Roughness 		

4.1.2 Financial Evaluation

The financial evaluation will be conducted by calculating the Total Fixed Price for the requirement requested in accordance with the pricing table provided in Annex B – Basis of Payment.

Evaluation of Price - Bid

The price of the bid will be evaluated in Canadian dollars, Applicable Taxes excluded, DAP 'Delivered at Place' Victoria, British Columbia Incoterms® 2020, Canadian customs duties and excise taxes excluded.

4.2 Basis of Selection - Mandatory Technical Criteria

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.



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. Unless specified otherwise, 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 Integrity Provisions of the Standard Instructions, all bidders must provide with their bid, **if applicable**, the declaration form available on the [Forms for the Integrity Regime](https://www.canada.ca/en/public-services-procurement/services/standards-oversight/supplier-integrity-compliance/forms.html#s2) website (<https://www.canada.ca/en/public-services-procurement/services/standards-oversight/supplier-integrity-compliance/forms.html#s2>), 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 section titled Information to be provided when bidding, contracting or entering into a real property agreement of the [Ineligibility and Suspension Policy](http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) (<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.

In addition to all other information required in the procurement process, the Bidder **must** provide the following:

- Bidders who are incorporated, including those bidding as a joint venture, must provide a complete list of names of all individuals who are currently directors of the Bidder or, in the case of a private company, the owners of the company.
- Bidders bidding as sole proprietorship, as well as those bidding as a joint venture, must provide the name of the owner(s).

<u>SURNAME</u>	<u>GIVEN NAME(S)</u>	<u>TITLE</u>



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

There is no security requirement applicable to the Contract.

6.2 Statement of Requirement

The Contractor must provide the items detailed under the Statement of Requirement at Annex "A".

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://canadabuys.canada.ca/en/how-procurement-works/policies-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<https://canadabuys.canada.ca/en/how-procurement-works/policies-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

6.3.1 General Conditions

[2010A](#) (2022-12-01), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

6.4 Term of Contract

6.4.1 Period of the Contract

The period of the Contract begins on the date the Contract is awarded and ends one (1) year after delivery and acceptance of the goods.

6.4.2 Delivery Date (to be completed by the bidder)

OAE Mirrors – While delivery is requested 20 weeks upon Contract award, the best delivery date that could be offered is _____.

OAP Mirror – While delivery is requested 20 weeks upon Contract award, the best delivery date that could be offered is _____.

The fabrication of the two (2) OAE Mirrors has priority over the OAP mirror. The two OAE mirrors should be shipped as soon as they are ready, and the fabrication of the one (1) OAP should not delay the delivery of the two OAE mirrors.

6.4.3 Delivery Points (to be completed at contract award)

Delivery of the requirement will be made to delivery point specified below:

Victoria, British Columbia



6.4.4 Shipping Instructions - Delivered at Place

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

Delivery at Place (DAP) Victoria, British Columbia Incoterms® 2020 for shipments from a commercial contractor.

NRC Customs contacts for any Customs and Transportation Logistics enquiries:

- Daniel Frampton: (613) 993-9113 / daniel.frampton@nrc-cnrc.gc.ca
- Christian Latreille: (613) 993-2259 / christian.latreille@nrc-cnrc.gc.ca

As part of NRC's commitment to Greening Government Operations, the Contractor is encouraged to minimize, include recycled content, re-use, or reduce/eliminate toxics in packaging, when possible.

6.4.5 Prepaid Transportation Costs

The Contractor must prepay transportation costs. Prepaid transportation costs must be shown as a separate item on the invoice, supported by a certified copy of the prepaid transportation bill of lading.

6.4.6 Packaging

The methods used for preservation and packaging must be in conformity with the Contractor's normal standard for domestic shipment or, if necessary, with standards for overseas shipment as below deck cargo.

6.4.7 Delivery and Unloading

1. Delivery trucks must be equipped with an unloading device which will permit unloading at sites with no hydraulic, stationary or other type of unloading facility.
2. When making deliveries, sufficient personnel must be provided to permit unloading of any type of vehicle without the assistance of federal government personnel.
3. At some sites, the delivery truck must be unloaded while parked at the curb. When material is placed on the sidewalk, it must be placed in proximity to the designated entrance so as to be readily accessible to transport by mechanical handling equipment utilized by site personnel.

6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Wendy Semegen
Title: Senior Contracting Officer
National Research Council Canada
Directorate: Finance and Procurement Services
Address: 1200 Montreal Road, Ottawa, ON K1A 0R8

E-mail address: Wendy.Semegen@nrc-cnrc.g.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 Technical Authority *(to be completed at contract award)*

The Technical Authority for the Contract is:

Name: _____

Title: _____

Organization: _____

Address: _____

Telephone: ____ _

E-mail address: _____

The Technical Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority; however, the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

6.5.3 Contractor's Representative *(to be completed by the Bidder)*

Name: _____

Title: _____

Address: _____

Telephone: ____ _

E-mail address: _____

6.6 Payment

6.6.1 Basis of Payment

The Contractor will be paid for costs reasonably and properly incurred in the performance of the work under this Contract in accordance with the following:

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a fixed unit price as specified in Annex B for a cost of \$ _____ *(to be completed at contract award)*. Customs duties are excluded and Applicable Taxes are extra.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

6.6.2 Method of Payment – Multiple Payments

Canada will pay the Contractor upon completion and delivery of the units in accordance with the payment provisions of the Contract if:

- a. An accurate and complete invoice and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b. all such documents have been verified by Canada;
- c. the Work delivered has been accepted by Canada.



6.6.3 SACC Manual Clauses

SACC Manual clause [C2000C](#) (2007-11-30), Taxes - Foreign-based Contractor

SACC Manual clause [C2605C](#) (2008-05-12), Canadian Customs Duties and Sales Tax - Foreign-based Contractor

6.6.4 Electronic Payment of Invoices – Contract

The Contractor accepts to be paid using any of the following Electronic Payment Instrument(s):

- a. Direct Deposit (Domestic Only);
- b. Wire Transfer (International Only);

6.7 Inspection and Acceptance

The Technical Authority is the Inspection Authority. All reports, deliverable items, documents, good and all services rendered under the Contract are subject to inspection by the Inspection Authority or representative. Should any report, document, good or service not be in accordance with the Statement of Requirement and to the satisfaction of the Inspection Authority, as submitted, the Inspection Authority will have the right to reject it or require its correction at the sole expense of the Contractor before recommending payment.

6.8 Invoicing Instructions

6.8.1 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.

6.8.2 Invoices must be distributed as follows:

- (a) One (1) electronic copy must be e-mailed to the Contracting Authority:

Wendy.Semegen@nrc-cnrc.gc.ca

- (b) Invoices and order confirmations **MUST** be sent via e-mail to:

nrc.invoice-facture.cnrc@nrc-cnrc.gc.ca

- (c) To facilitate the payment process, it is important that the Contractor quote the contract number on all the invoices, shipping bills and packing slips. Failure to do so will delay payment and the date used for calculating interest on overdue accounts.

PLEASE QUOTE CONTRACT NO. *[to be inserted at contract award]* ON ALL DOCUMENTATION AND INVOICES.

6.9 Certifications and Additional Information

6.9.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.



6.10 Applicable Laws

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

6.11 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) the General Conditions [2010A](#) (2022-12-01) General Conditions - Goods (Medium Complexity);
- (c) ANNEX A, Statement of Requirement;
- (d) ANNEX B, Basis of Payment;
- (e) the Contractor's bid dated _____ (*insert date of bid*).

6.12 SACC Manual Clauses

SACC Manual clause [G1005C](#) (2016-01-28) Insurance – No Specific Requirements

6.13 Dispute Resolution

- (a) The parties agree to maintain open and honest communication about the Work throughout and after the performance of the contract.
- (b) The parties agree to consult and co-operate with each other in the furtherance of the contract and promptly notify the other party or parties and attempt to resolve problems or differences that may arise.
- (c) If the parties cannot resolve a dispute through consultation and cooperation, the parties agree to consult a neutral third party offering alternative dispute resolution services to attempt to address the dispute.
- (d) Options of alternative dispute resolution services can be found on Canada's Buy and Sell website under the heading "[Dispute Resolution](#)".



ANNEX "A" STATEMENT REQUIREMENT

SPIDERS Off-Axis Ellipsoid (OAE) Mirrors & GPI CAL2.0 Off-axis Parabola OAP Mirror

1.0 Objective

The National Research Council of Canada (NRC) Herzberg Astronomy and Astrophysics Research Center (HAA) has a requirement for two (2) custom off-axis ellipsoid (OAE) mirrors and one (1) custom off-axis parabola (OAP) mirror to be manufactured.

The two OAE mirror are required for the Subaru telescope Pathfinder Instrument for Detecting Exoplanets and Retrieving Spectra (SPIDERS) project, while the one OAP mirror is required for upgrading the CAL system of the Gemini telescope Planet Imager instrument (GPI).

Glossary

CA – Clear Aperture

CTE – Constant of Thermal Expansion

GPI – Gemini Planet Imager

NRC – National Research Council of Canada

OAE – off-axis ellipsoid (mirror)

OAP – off-axis parabola (mirror)

OAD – off-axis distance

PTV – peak to valley

RMS – root mean square

ROC – radius of curvature

SPIDERS – Subaru Pathfinder Instrument for Detecting Exoplanets and Retrieving Spectra

2.0 Mandatory Technical specifications

The two (2) Mirrors “OAE1” and “OAE2” must meet the following specifications:

	Off-axis Ellipsoid 1 (OAE1)	Off-axis Ellipsoid 2 (OAE2)
The mirror must be manufactured from this Substrate:	Any precision polishing glass or ceramics with a CTE<11e-6	
The mirrors must have an Outer Diameter of	76.2mm (+0.0/-0.5mm)	38.1mm (+0.0/-0.5mm)
The mirrors must have a Edge Thickness of	25mm (+2.5/-2.5mm)	19mm (+2.5/-2.5mm)
The theoretical Parent Ellipse of each child mirror must have a Radius of Curvature (ROC) at Vertex of	905.801 mm	546.090 mm
The child mirrors must be concave with a ROC at their center, of	919.406 mm (±0.2%)	555.529 mm (±0.2%)
The theoretical Parent Ellipse of each child mirror must have a Conic constant of	-0.0506	-0.2756
The mirrors must have an Off-Axis	494.471mm (±2mm) from	136.951 mm (±2mm) from



Distance (OAD) of	major-axis to substrate <u>center</u>	major-axis to substrate <u>center</u>
The mirrors must have a Clear Aperture (CA) Diameter of	65mm or greater centered on substrate	30mm or greater centered on substrate
The mirrors must have a surface Quality of	40-20 Scratch-Dig per MIL-PRF-13830B	
The mirrors must have a surface Irregularities (PTV and RMS specs shall be met simultaneously. Focus and astigmatism can be removed from the surface measurements as these aberrations are already controlled by ROC and OAD tolerances (+/-0.2% and +/-2mm respectively) and can be compensated by adjusting the position of the as-built OAE mirror. Irregularities at higher spatial frequencies do not impact the field of interest and can be filtered out if that helps meeting the requirement) of:	<ul style="list-style-type: none"> < 50nm PTV over the CA with focus and astigmatism removed < 10nm RMS over the CA, for spatial frequencies <1.5 cycles/mm with focus and astigmatism removed 	<ul style="list-style-type: none"> < 50nm PTV over the CA with focus and astigmatism removed. < 10nm RMS over the CA, for spatial frequencies <4 cycles/mm, with focus and astigmatism removed.
The mirrors must have a surface micro-roughness of:	< 1 nm RMS	
The mirrors must be coated with:	Protected Silver	
The Back Surface of the mirrors must be:	Ground, Flat, Parallel to front surface center (i.e. $-57.2 \pm 0.5^\circ$ from major-axis) (no wedge)	Ground, Flat, Parallel to front surface center (i.e. $-75.6 \pm 0.5^\circ$ from major-axis) (no wedge)
The mirrors must have Edges cut as:	Normal to back surface	
The mirrors must have their clocking orientation indicated by a:	Pencil mark on the edge and back surfaces pointing toward Vertex ($\pm 3^\circ$)	
A test report must include, for each mirror,	As-built mirror diameter, thickness and material. Full-clear-aperture raw and spatially filtered (if filtering is needed to meet surface irregularity specs) interferograms with description of the spatial filtering applied (if any); PTV and RMS achieved amplitudes for surface irregularities before and after spatial filtering; as-built ROC; as-built OAD errors in X and Y.	

Additional information about the OAE Mirrors

- **Mirror surface point cloud**

A point cloud can be provided upon request to allow the mirrors to be polished and tested as freeform stand-alone optics without defining the parent ellipsoid. In that case the cloud point takes precedence over the specifications listed in Sec. 2.0.

Figure 1 plots the total sag and sphere departure of each mirror in microns computed in Matlab with 501 points across the diameter of the mirror. Other formats and spatial resolutions can be generated upon request to match your polishing machine software requirements.

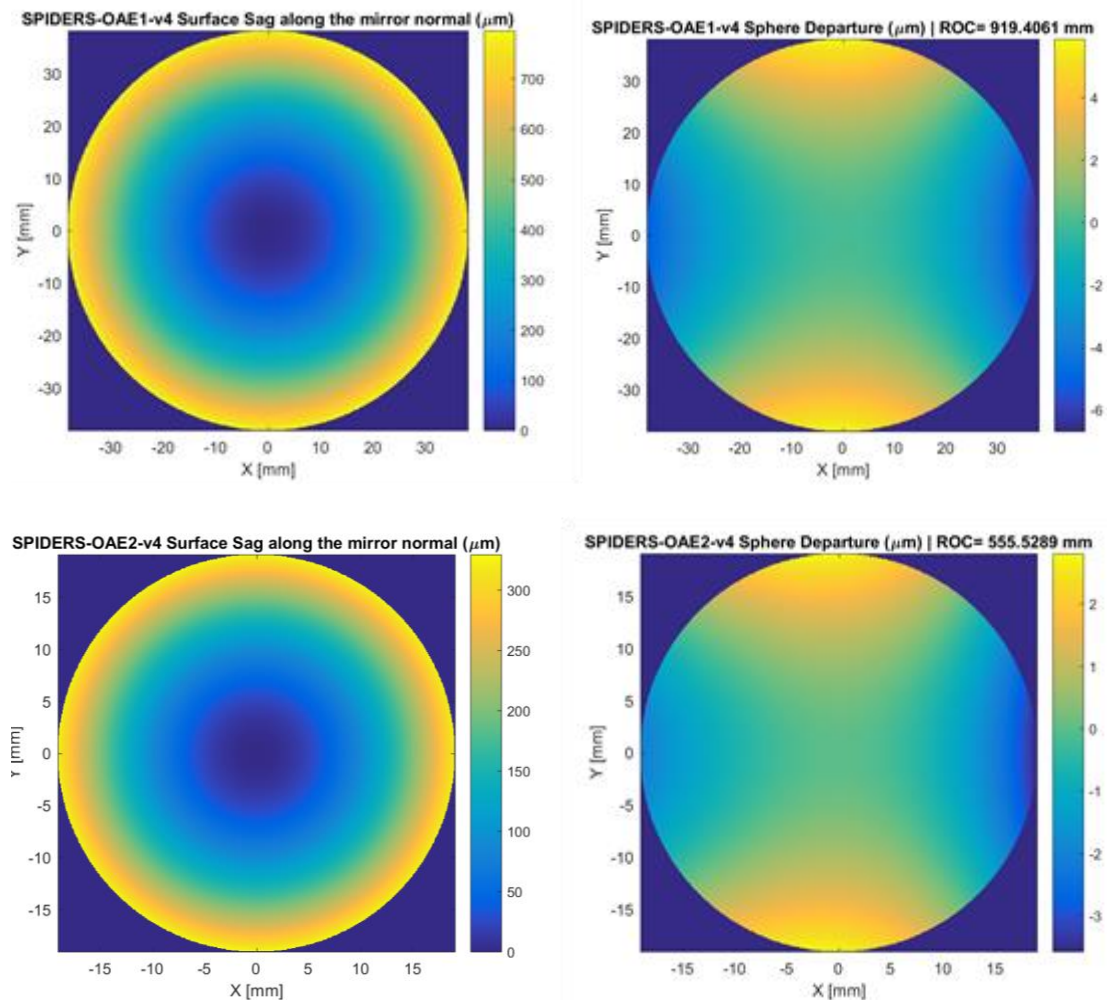


Figure 1: Total sag (top row) and sphere departure (bottom row) of both mirror surfaces calculated in MATLAB along the axis normal to the mirror. The total surface sag corresponds to the glass thickness profile if the back surface is parallel to the front surface center (no wedge). ROC is the radius of curvature of the best sphere. The direction pointing to the apex of the parent ellipsoid is on the left side.

- **Parent Ellipse Geometry**

	Off-axis Ellipsoid 1	Off-axis Ellipsoid 2	Units
Object distance (FM)	772.350	367.221	mm
Image distance (F'M)	1135.786	1140.449	mm
Fold angle (\angle FMF')	14.0	15.0	deg
Semi-major axis (OA)	954.0678	753.8352	mm
Semi minor-axis (OB)	929.6212	641.6089	mm
Semi foci separation (OF)	214.5925	395.7343	mm
Focus-to-Vertex distance (FA)	739.4753	358.1009	mm
Off-axis angle at Focus (\angle AFM)	39.8080	21.8970	deg
Off-axis angle at center (\angle AOM)	32.1343	12.3246	deg

Off-axis distance (HM)	494.4714	136.9513	mm
Tangent line slope angle in M	-57.1920	-75.6030	deg

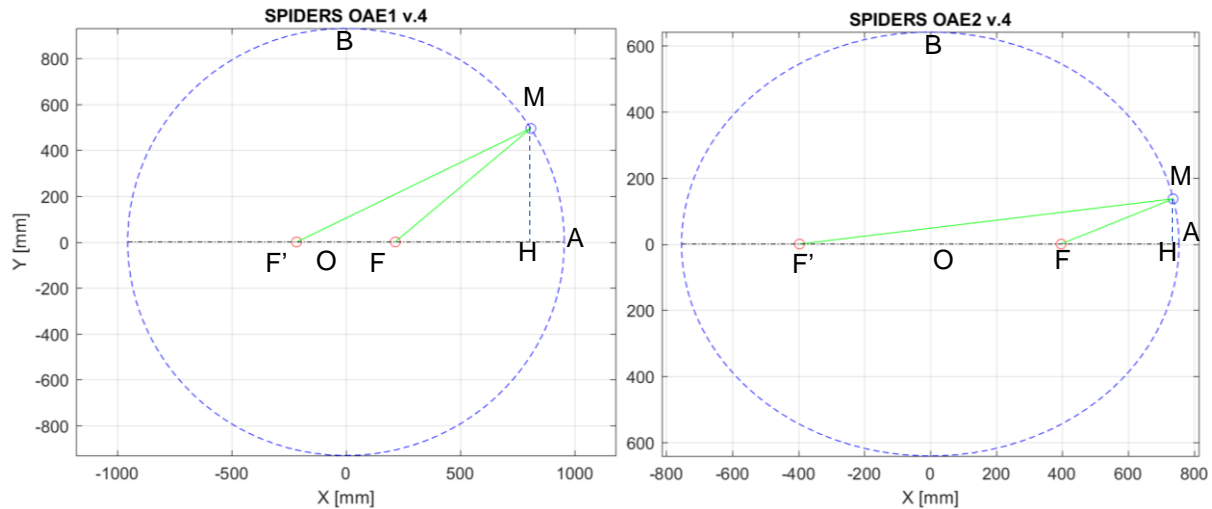


Figure 2: Mirror center is in M, object focus in F, Image focus in F', vertex of parent ellipsoid in A. The parent ellipsoids are obtained by rotating these ellipses around their major-axes (prolate spheroids).

5.3 Intended Use (for reference)

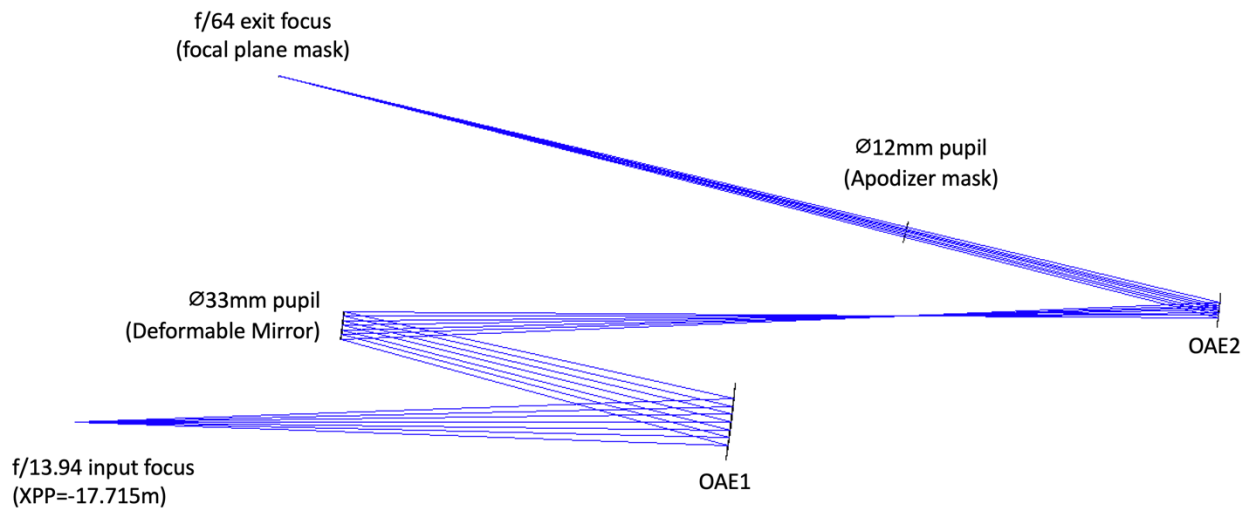


Figure 3: Intended use of the two off-axis ellipsoid mirrors in the Subaru Pathfinder Instrument for Detecting Exoplanets and Retrieving Spectra (SPIDERS). This portion of the layout and the definition of the OAE mirrors are available in Zemax file realOAE_v4.zmx.



Surf>Type	Comment	Radius	Thickness	Glass	Semi-Diameter	Conic	Par 0 (unused)	Decenter X	Decenter Y	Tilt About X
OBJ	Standard	Infinity	Infinity		Infinity	0.000000				
STO	Paraxial subaru pup		1.7715E+004	M	635.775000	U		1.7715E+004	1	
2	Standard	F/13.97	Infinity		0.000000		0.000000			
3	Coordinat..		739.475300		-	0.000000		0.000000	0.000000	39.808000
4*	Standard	OAE1	-905.800900		MIRROR	517.911225		-0.050600		
5	Coordinat..		-1052.10738	M		-	0.000000		0.000000	508.784215
6	Standard	IF	Infinity		664.342213	U		0.254176	0.000000	
7	Standard	DM pupil	Infinity		0.000000		16.272178	0.000000		
8	Coordinat..		0.000000		-	0.000000		0.000000	0.000000	-7.500000
9	Standard	DM	Infinity		MIRROR	16.359026		0.000000		
10	Coordinat..		664.342213	F		-	0.000000	0.000000	0.000000	-7.500000
11	Standard	back to IF	Infinity		0.000000		0.254176	0.000000		
12	Coordinat..		358.100900		-	0.000000		0.000000	0.000000	21.897000
13*	Standard	OAE2	-546.090000		MIRROR	146.051927		-0.275600		
14	Coordinat..		-1141.25765	M		-	0.000000		0.000000	138.046274
15	Standard	f/64 FPM focus	Infinity		760.314293	U		0.785941	0.000000	
16	Standard	APO pupil	Infinity		-760.314293	F		12.500000	U	0.000000
17	Standard	f/64 focus	Infinity		0.000000			0.785941	0.000000	

Figure 4: Screenshot of Zemax lens editor

National Research Council Canada (NRC)

The one (1) OAP Mirror must meet the following specifications:

The mirror must be manufactured from material Zerodur (or equivalent) preferred; fused silica accepted.
The mirrors must have a blank dimension: circular 56mm +0.00/-0.5 mm diameter
The mirror must have a clear aperture >50.5x34.5mm stadium-shaped (see figure 6)
The mirror must have a central thickness of 20.595±0.5mm
The mirror must have a parent focal length of 633.52 mm +/- 1 mm (+/-0.15%)
The mirror must have a off-axis distance (OAD) of 128.26 mm +/- 0.25 mm
The mirror must have a coating of bare gold
The mirrors must have a surface Irregularities of $\lambda/20$ P-V @ 633 nm on any 32mm diameter area within the clear aperture.
The mirrors must have a surface roughness of <0.5nm RMS (root mean square)
The mirror must have a scratch / dig of 10-5 per MIL-PRF-13830B
The mirrors must have a bevel of: 0.3 mm @ 45 degrees typical
The mirrors must have Back surface: Flat, ground, no wedge w.r.t. front surface to within +/-0.5 deg:
The mirror must have edges: Ground, square with back surface to within +/-0.5 deg.
The mirror must have an Indicator for rotation: Please indicate the location of the parent parabola axis (X negative) with a scribe mark on the outer diameter of the optic (to within +/- 2 deg.)
A test report must include, for the mirror, As-built mirror diameter, thickness and material. as-built parent focal-length, as-built OAD, full-clear--aperture interferograms, achieved PTV and RMS amplitudes for surface irregularities

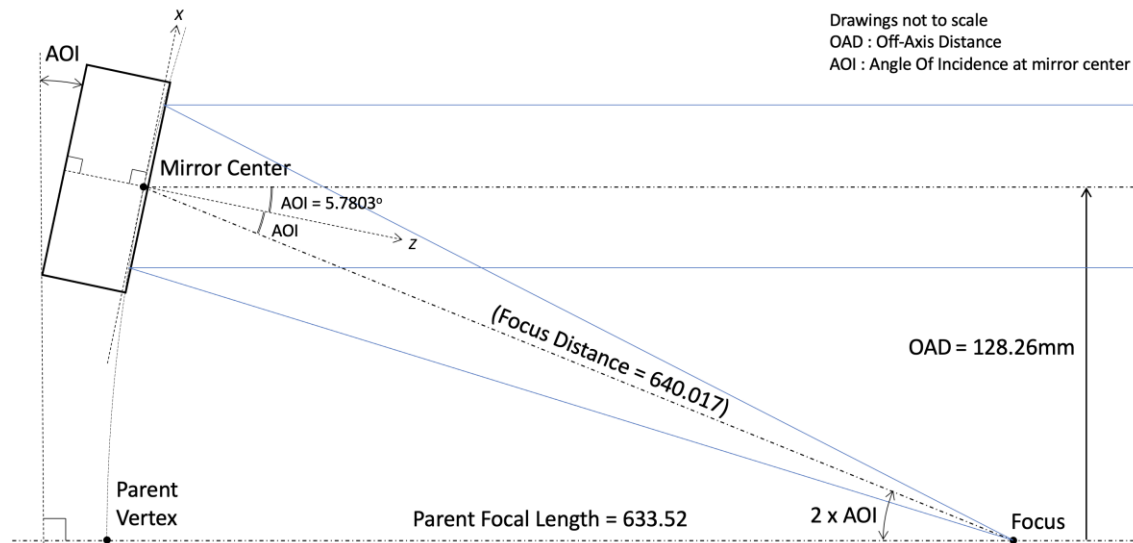


Figure 5: Parent parabola parameters.

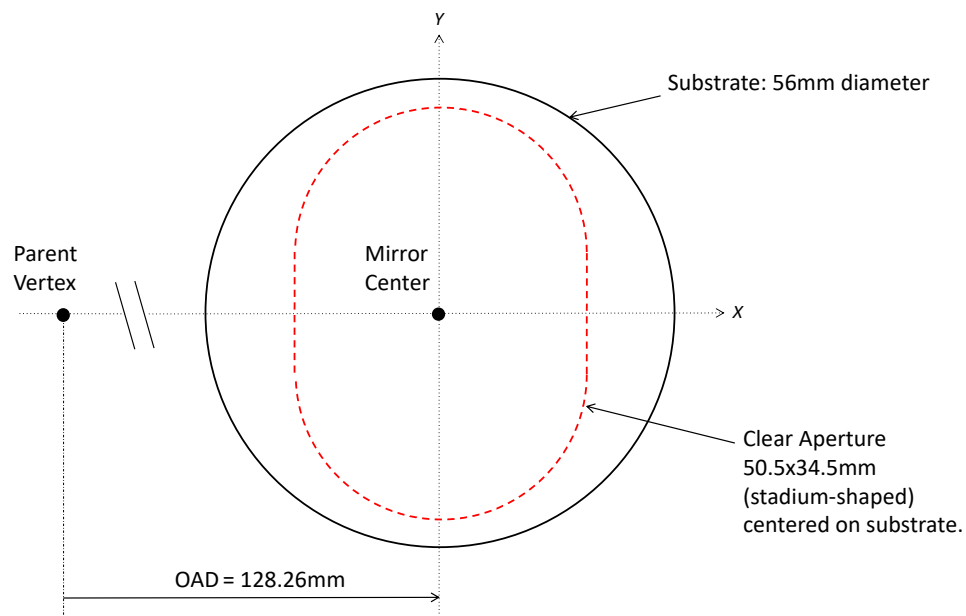


Figure 6: Clear Aperture and blank dimensions. OAD not to scale and not exactly in the figure plane.

Surface sag point cloud can be provided upon request in any format for freeform grinding and polishing machines (Figure 3).

- Best sphere radius of curvature is -1280.16mm (concave),
- Maximum sag is about 300um.
- Sphere departure <3.8um PTV.

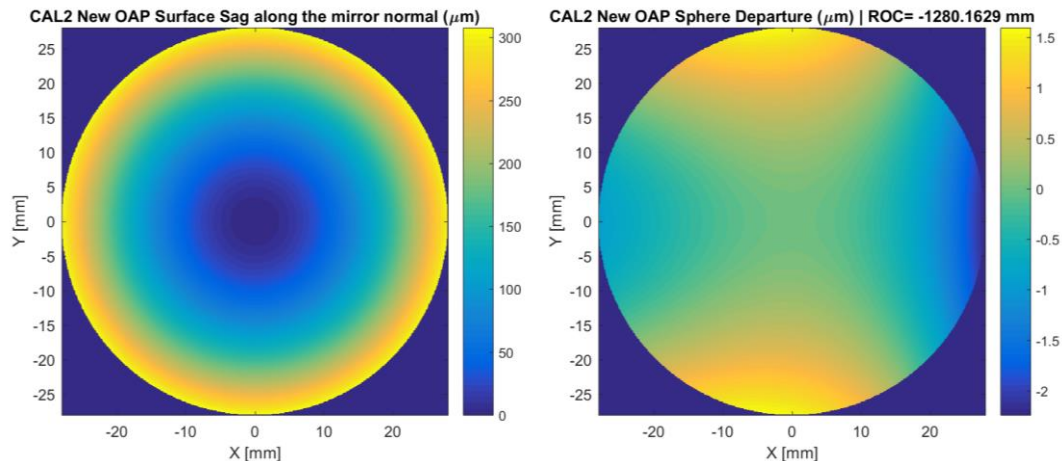


Figure 7 Total sag and sphere departure of the mirror surface calculated in MATLAB along the axis normal to the mirror center. The total surface sag corresponds to the glass thickness profile if the back surface is parallel to the front surface center (no wedge). ROC is the radius of curvature of the best sphere. The direction pointing to the apex of the parent parabola is on the left side.

3.0 Deliverables:

- One (1) “OAE1” mirror shipped in a non-contact package
- One (1) “OAE2” mirror shipped in a non-contact package
- One (1) “OAP” mirror shipped in a non-contact package
- Test report for each mirror including interferograms and description of the spatial filtering applied (if any), as-built ROC, as-built OAD errors in X and Y (only if interferograms exclude both astigmatisms), material certificate of conformity.

4.0 Constraints

The fabrication of the two OAE mirrors has priority over the OAP mirror. The two OAE mirrors should be shipped as soon as they are ready, and the fabrication of the OAP should not delay the delivery of the two OAEs.



ANNEX "B" BASIS OF PAYMENT

The Bidder must provide all of the pricing requested in the following Table in accordance with Article 6.6.1 - Basis of Payment.

Item	Description	Quantity	Fixed Unit Price CAD
1	Off-axis Ellipsoid 1 (OAE1) (As described in Annex A)	1	\$
2	Off-axis Ellipsoid 2 (OAE2) (As described in Annex A)	1	\$
3	Off-axis Parabola (OAP) (As described in Annex A)	1	\$
4	Shipping, Delivery and Handling	1	\$
TOTAL Applicable taxes are extra, if applicable			\$ CAD