



RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
**Bid Receiving Public Works & Government
Services Canada/Réception des soumissions
Travaux publics et Services gouvernementaux
Canada**
1713 Bedford Row
Halifax, N.S./Halifax, (N.E.)
B3J 1T3
Halifax
Bid Fax: (902) 496-5016

**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 Substation	
Solicitation No. - N° de l'invitation 5P300-150656/A	Date 2016-01-12
Client Reference No. - N° de référence du client 5P300-15-0656	
GETS Reference No. - N° de référence de SEAG PW-\$PWA-122-5343	
File No. - N° de dossier PWA-5-74123 (122)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2016-02-23	Time Zone Fuseau horaire Atlantic Standard Time AST
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: Chinye (PWA), Chukwudi	Buyer Id - Id de l'acheteur pwa122
Telephone No. - N° de téléphone (902) 496-5476 ()	FAX No. - N° de FAX (902) 496-5016
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: FORTRESS OF LOUISBOURG NHSC SEE HEREIN LOUISBOURG NOVA SCOTIA B1C2L2 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

Atlantic Region Acquisitions/Région de l'Atlantique
Acquisitions
1713 Bedford Row
Halifax, N.S./Halifax, (N.E.)
B3J 3C9
Halifax
Nova Scot

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

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PART 1 - GENERAL INFORMATION

1.1 Requirement

This is a goods requirement for the design, manufacture, testing and supply of 4160V-600V indoor Substation assembly complete with accessories and special tools in accordance with Annex A-Requirement and Annex C-Schedule.

The offloading, erection, erection, testing and commissioning of the indoor unit substation Assembly and associated components will be carried out by Representatives of Park's Canada

1.2 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.

1.3 Trade Agreements

The requirement is subject to the provisions of the North American Free Trade Agreement (NAFTA), and the Agreement on Internal Trade (AIT)."

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>) 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](#) (2015-07-03) 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 days

2.2 Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

2.3 Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than **five (5)** calendar 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.

2.4 Applicable Laws

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

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 (One hard copy)

Section II: Financial Bid (One hard copy)

Section III: Certifications (One 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.

3.1.1 Exchange Rate Fluctuation

[C3011T](#) (2013-11-06), Exchange Rate Fluctuation

3.1.2 SACC Manual Clauses

Section III: Certifications

Bidders must submit the certifications 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 the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

4.1.1 Financial Evaluation

SACC Manual Clause [A0220T](#) (2014-06-26), Evaluation of Price

4.2 Basis of Selection

4.2.1 SACC Manual Clause (A0069T) (2007-05-25), (Basis of Selection)

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 Declaration of Convicted Offences

As applicable, pursuant to subsection Declaration of Convicted Offences of section 01 of the Standard Instructions, the Bidder must provide with its bid, a completed [Declaration Form](http://www.tpsgc-pwgsc.gc.ca/ci-if/formulaire-form-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ci-if/formulaire-form-eng.html>), 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 – List of Names

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.

Bidders bidding as sole proprietorship, as well as those bidding as a joint venture, must provide the name of the owner(s).

Bidders bidding as societies, firms or partnerships do not need to provide lists of names.

5.2.2 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](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" list (http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) available from [Employment and Social Development Canada \(ESDC\) - Labour's](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml) website.

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](http://www.labour.gc.ca/eng/standards_equity/eq/emp/fcp/list/inelig.shtml)" 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 Requirement

The Contractor must provide the design, manufacture, testing and delivery of one (1), 4160V-600V indoor unit substation assembly complete with accessories and special tools in accordance with the Requirement at Annex "A".

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5P300-150656

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File No. - N° du dossier

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pwa122
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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>) issued by Public Works and Government Services Canada.

6.3.1 General Conditions

2010A (2015-09-03), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

6.4 Term of Contract

6.4.1 Delivery Date

All the deliverables must be received on or before March 31, 2016. If the goods are not received by this date the contract will be terminated.

6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Chukwudi Chinye
Title: Real Property Contracting Officer
Public Works and Government Services Canada
Acquisitions Branch
Address: 1713 Bedford Row, Halifax, NS B3J 3C9
Telephone: 902-496-5476
Facsimile: 902-496-5016

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 Project Authority

The Project Authority for the Contract is: (To be determined at contract award)

Name: _____
Title: _____
Organization: _____
Address: _____

Telephone : _____
Facsimile: _____
E-mail address: _____

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The Project 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 Project Authority, however the Project 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 supplier).

Name: _____
Company Name: _____
Telephone Number: ____-____-_____
Cellular Number: ____-____-_____
Facsimile Number: ____-____-_____

6.6 Proactive Disclosure of Contracts with Former Public Servants

By providing information on its status, with respect to being a former public servant in receipt of a [Public Service Superannuation Act](#) (PSSA) pension, the Contractor has agreed that this information will be reported on departmental websites as part of the published proactive disclosure reports, in accordance with [Contracting Policy Notice: 2012-2](#) of the Treasury Board Secretariat of Canada

6.7 Payment

6.7.1 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(s), as specified in Annex B" for a cost of \$_____. (**To be determined at contract award**). Customs duties are included" 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.

6.7.2 Limitation of Price

SACC Manual clause [C6000C](#) (C6000C) Limitation of Price

6.7.3 Single Payment.

H1000C- Single Payment- 2008-05-12.

6.7.4 SACC Manual Clauses

T1204 - Direct Request by Customer Department-A9117C-2007-11-30

6.7.5 Clauses du Guide des CCUA

Shipping Instructions - Free on Board Destination and Delivered Duty Paid

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

FOB Destination Shipping and Receiving, Fortress of Louisbourg, NHSC, 259 Park Services Road, Louisbourg, B1C 2L2, Nova Scotia including all delivery charges, administration, insurance costs and

risks of transport, customs clearance and customs duties and Applicable Taxes to the destination as identified in the contract.

6.8 Invoicing Instructions

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 two (2) copies must be forwarded to the following address for certification and Payment.

Attention: Audrey Buchanan
Fortress of Louisbourg, NHSC,
259, Park Service Road,
Louisbourg, NS
B1C 2L2,

6.9 Certifications

6.9.1 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.

6.10 Applicable Laws

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

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, 2015-09-03- Goods (Medium Complexity));
- (c) Annex A, Requirement;
- (d) Annex B, Basis of Payment
- (e) the Contractor's bid dated _____ (*insert date of bid*)

6.12 Automobile Liability Insurance

1. The Contractor must obtain Automobile Liability Insurance, and maintain it in force throughout the duration of the Contract, in an amount usual for a contract of this nature, but for not less than \$2,000,000 per accident or occurrence.
2. The policy must include the following:
 - a. Third Party Liability - \$2,000,000 Minimum Limit per Accident or Occurrence
 - b. Accident Benefits - all jurisdictional statutes

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- c. Uninsured Motorist Protection
- d. Notice of Cancellation: The Insurer will endeavour to provide the Contracting Authority thirty (30) days written notice of cancellation.

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N° CCC / CCC No./ N° VME - FMS

ANNEX "A"

REQUIREMENT

Attached

N° de l'invitation - Solicitation No.
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 N° de réf. du client - Client Ref. No.
 5P300-150656

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ANNEX "B"

Basis of Payment

Column A	Column B Item Description	Column C Unit of Measure	Column D Estimated Quantity	Column E Price per unit	Column F Extended Price = Column D*Column E
1	Design, Manufacture Supply and Delivery of 4160V-600V indoor unit substation in accordance with Annex A and C	Lot	1	\$ _____	\$ _____ (i)
2	Erection Supervisor to supervise the erection and commission of equipment being supplied	Per hour	4	\$ _____	\$ _____ (ii)
3	Spare parts, recommended accessories and special tools.				\$2000.00 (iii)
				Grand total	\$ _____ (i+ii+iii) HST extra

Price per unit for erection supervisor must include all costs associated with the performance of the work as well as travel to and from site.

The Grand total will be the amount that will be considered during evaluation of all bids tendered.

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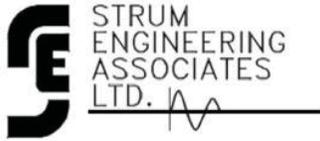
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Spare Parts(Recommended)	Estimated quantity	Unit of Measurement	Price per unit
1.			\$
2.			\$
3.			\$
4.			\$
5.			\$
6.			\$

Accessories and special tools (Recommended)	Estimated quantity	Unit of Measurement	Price per unit
1.			\$
2.			\$
3.			\$
4.			\$
5.			\$
6.			\$

NOTE:

The spare parts, accessories and special tools prices will not form part of the evaluation.



Dartmouth Office
80 Eileen Stubbs Ave.
Dartmouth, N.S. B3B 1Y6
Tel: (902) 468-7325
Fax: (902) 468-1908

Sydney Office
401 Esplanade
Sydney, N.S. B1P 1B2
Tel: (902) 562-3311
Fax: (902) 562-4152

PARKS CANADA

**MANUFACTURE, TESTING AND DELIVERY
OF ONE (1) 150kVA 4160V-600V INDOOR
UNIT SUBSTATION ASSEMBLY**

OCTOBER, 2015

**SPECIFICATION No.
001-223-1-15 REV 1**

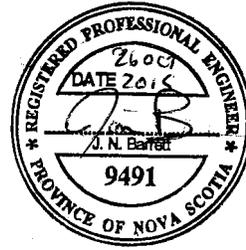
STRUM ENGINEERING ASSOCIATES LTD.

SPECIFIC-ATION

PARKS CANADA

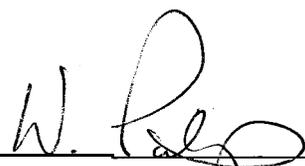
MANUFACTURE, TESTING AND DELIVERY
OF ONE (1) 150kVA 4160V-600V
INDOOR UNIT SUBSTATION ASSEMBLIES

SPECIFICATION No. 001-223-1-15 REV 1




~~SIGNED AND SEALED:~~
J. BARRETT, P. ENG.
ELECTRICAL ENGINEER

SIGNED:


W. PICKUP, P. E. (G)
SENIOR ENGINEER

STRUM ENGINEERING ASSOCIATES LTD.

OCTOBER, 2015

STRUM ENGINEERING ASSOCIATES LTD.

SPECIFICATION

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- A. TECHNICAL REQUIREMENTS**
- B. SCHEDULES**

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TECHNICAL REQUIREMENTS

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SECTION A
TECHNICAL REQUIREMENTS

SECTION A

TECHNICAL REQUIREMENTS

1. SCOPE OF WORK

- 1.1 Design, manufacture, test, deliver to Parks Canada, Nova Scotia, and provide a written warranty for one (1), 4160V-600V indoor unit substation assembly, complete with all accessories and special tools.
- 1.2 Offloading, erection, testing and commissioning of the indoor unit substation assembly and associated components will be carried out by others and does not form part of this Contract.

2. SERVICE CONDITIONS

2.1 Application

- 2.1.1 The unit substation assembly will be installed indoors, in an unheated room, at the Fortress of Louisbourg National Historic Site.
- 2.1.2 The new 150kVA, 4160V-600V indoor unit substation assembly will be supplied by an existing 4160V underground power cable. The switchgear assembly will include two (2) 4160V load-break group-operated disconnect switches, fused protection for the power transformer and a 4160V-600V dry type power transformer.

2.2 Existing Supply System Data

2.2.1 4160V System Data

Nominal service voltage	kV rms	4.16
Rated (maximum) voltage	kV rms	4.58
Rated frequency	Hz	60
No. of phases & wiring		3/3
Neutral grounding	Solidly grounded at utility interface transformer	
3 phase short circuit level (interrupting)	MVA	5

2.3 Environmental Data

2.3.1 Design and manufacture the indoor unit substation assembly to be suitable for operation under the following conditions:

Elevation above sea level	m	50
Maximum ambient temperature	°C	40
Minimum ambient temperature	°C	-40
Maximum relative humidity	%	100

2.3.2 The unit substation shall be designed for indoor service in an unheated room.

3. STANDARDS

3.1 Unless otherwise specified herein, design, manufacture, and test the substation assembly in accordance with the latest issue of the following standards:

CSA C22.1-15	Canadian Electrical Code; Part 1, Safety Standard for Electrical Installations
CSA C22.2 No.0.3 (R2013)	Insulation Coordination
CSA C22.2 No.31-14	Switchgear Assemblies
CSA C22.2-193 (R2014)	High-Voltage Full-Load Interrupter Switches
CSA C71-1-99	Insulation Coordination - Part 1: Definitions, Principles and Rules
CSA C71-2-98	Insulation Coordination - Part 2: Application Guide
CSA Z229.2-85	Quality Assurance Program
EEMAC G14-1 (1987)	EEMAC Procedure For Testing The Resistance Of Metal Clad Switchgear Under Conditions Of Arcing Due To An Internal Fault

IEEE C37.20.7-2007 IEEE Guide for Testing Metal-Enclosed Switchgear
Rated up to 38kV for Internal Arcing Faults

C22.2 NO. 0.22-11 Evaluation methods for arc resistance ratings of
enclosed electrical equipment

C22.2 NO. 66.1-06 Low Voltage Transformers - Part 1: General
Requirements

C22.2 NO. 47-13 Air-cooled transformers (dry type)

C9-02 (R2007) Dry-Type Transformers

CAN/CSA-C802.2-12 Minimum efficiency values for dry-type transformers

3.2 Apply all reference publications and amendments listed within the above
standards.

3.3 Other alternative standards may be used if approved by the Owner's Engineer.

4. DESIGN BASIS

4.1 Base the detailed design on information shown on the Single Line Diagram
referenced in Section 12 of this Specification. Produce detailed drawings and
submit for review prior to the start of manufacture.

5. EQUIPMENT, APPARATUS AND MATERIAL SUPPLIED BY OTHERS

5.1 All power, grounding and bonding conductors and sources of power external
to the unit substation assembly.

6. PRODUCT DELIVERY, STORAGE AND HANDLING

6.1 All hardware removed for shipping and required to bolt together the unit
substation sections, the main phase bus bars, the ground bus bars and the
bus insulation boots shall be shipped loose and clearly identified.

6.2 Crate all switchgear parts and components removed for shipment to prevent
damage. All parts and components shall be free from rust.

7. 4160V-600V UNIT SUBSTATION INFORMATION

7.1 Ratings and Data

7.1.1 4160V Switchgear Section

Nominal Voltage Class	kV rms	4.16
Maximum Voltage Rating	kV rms	5
Operating Frequency	Hz	60
Rated Current for Continuous Service at 40°C	A rms	600
Maximum Interrupting Current Rating	kA	25
Rated BIL	kV	60

7.1.2 4160V-600V Power Transformer Section

Type		three phase, dry type, epoxy insulation sealed
Winding material		copper
Rating	kVA	150
Temperature Rise Rating	C	115
Insulation Class		220
Operating Frequency	Hz	60
Primary Voltage	V rms	4160
Primary Winding Connection		delta
Primary Winding BIL	kV	60

Secondary Voltage	V rms	600/347
Secondary Winding Connection		solidly grounded wye (grounded by others)
Secondary Winding BIL	kV	10
Primary taps		Off load, bolted link 4 - 2.5% 2 FCAN, 2 FCBN

8. CONSTRUCTION

- 8.1 It is the intention that the Bidder will supply an integrated indoor unit substation assembly as indicated on the reference drawing and as described in this specification.
- 8.2 The indoor unit substation assembly shall be designed and constructed in bolt-together sections. Submit drawings of the equipment to the Owner's Engineer for review. Do not start the manufacture until the review has been completed.
- 8.3 Incoming and out-going MV terminals shall be suitable for terminating NEMA standard cable lugs.
- 8.4 X0, X1, X2, and X3 terminals shall be suitable for terminating NEMA Standard cable lugs.
- 8.5 The X0 terminal must be insulated to be grounded externally by others.
- 8.6 The equipment will be installed in an existing, unheated electrical room.
- 8.7 4160V Switches
 - 8.7.1 The indoor unit substation assembly shall be provided with two (2) 4160V, two (2) position switches as indicated on the reference drawing. One switch shall provide a means to isolate the unit substation transformer. One switch shall provide a means to isolate the out-going 4160V cable and connected loads.

- 8.7.2 Provide a window to view the position each set of 4160V switch blades without opening the cabinet door. The viewing window shall be compatible with infrared camera thermal imaging. Alternatively, separate IR windows can be installed to allow for thermal imaging of the switch blades.
- 8.7.3 Provide means to padlock the 4160V switches in the OPEN position.
- 8.7.4 Provide interlock to ensure the 4160V transformer isolation switch is OPEN before access can be gained to the 4160V-600V transformer cubicle.
- 8.8 Lifting eye bolts, circular-type, shall be supplied on each section of switchgear for lifting.
- 8.9 Transformer Core
 - 8.9.1 The completed core shall be sealed in varnish or epoxy to reduce noise emissions and prevent the ingress of moisture.
- 8.10 Buswork:
 - 8.10.1 Buswork through the unit substation assembly be made from high conductivity hard drawn copper. All current carrying parts shall be copper. (alternative use of aluminium busbars may offered)
 - 8.10.2 Tin plate (0.003" minimum thickness) all surfaces of the bus forming current carrying bolted joints or customer cable connections to the bus. Use a minimum of 2 bolts at each joint and silicon bronze hardware throughout.
 - 8.10.3 Fully insulate all buswork, joints, and connections with a non-hygroscopic, flame-retardant, corona resistant material.
 - 8.10.4 Provide a bare, copper ground bus, 2 inch x ½ inch (minimum size) extending along the entire length of the unit substation. The ground bus shall be mounted near the bottom of the assembly. Provide one hole, long barrel, copper, crimp-type compression connectors for #4/0 AWG copper grounding conductors at each end of the ground bus.

8.10.5 Each phase shall be clearly identified by means of colour coding applied to the bus throughout each cell and at the cable connection points. The colour coding shall be as follows:

- Phase A – Red
- Phase B – Yellow
- Phase C – Blue

Facing the front of the equipment, the phasing shall be Phase A, Phase B, Phase C, top to bottom, left to right, and front to back.

8.10.6 The buses and taps shall be inaccessible during normal service. The buses shall be supported on non-hygroscopic insulators in such a manner to withstand, without deformation, the electrodynamic stress resulting from a current equal to the rated momentary current of the switchgear.

8.8 Primary HRC Fuses:

8.8.1 Provide high rupturing capacity 5kV fuses with the following characteristics:

Rated maximum voltage	HV kV rms	5
Rated 3-phase short-circuit interrupting capacity	kA Asym.	100kA
Rated current	A rms	sized by Vendor for coordination
Type		current limiting
Speed		determined by Vendor to offer proper protection coordination
Rated impulse withstand voltage	kV crest	60

8.8.2 Provide fuse current/time curves.

8.8.3 Provide suitably rated fuses of the indicating type with visible indicators.

8.8.4 Supply one (1) spare set of fuses per unit substation. Mount spares conveniently in the switch compartment.

8.9 Cable Connections

8.9.1 Design the assembly for bottom entry of all power cables, protection and control cables.

8.10 Nameplates

8.10.1 Provide for each individual apparatus, one nameplate made of stainless steel and fixed to the apparatus with non-rusting screws, showing the following details:

- Manufacturer's name and address
- Manufacturer's model and serial number
- Manufacturing date
- Basic impulse insulation level
- Rated current (continuous service, 40°C, 60 Hz)
- Basic equipment data according to the standards of the equipment

8.11 Enclosure

8.11.1 The unit substation assembly enclosure shall be Type 12.

8.11.2 The maximum dimensions of the unit substation assembly shall be 2000mm (h) x 2400mm (w) x 1400mm (d).

8.12 Transformer Winding

8.12.1 The windings shall be vacuum pressure impregnated to prevent moisture ingress.

8.13 Primary Surge Arresters

Ratings and Data:

8.13.1 Provide primary surge arresters, mounted in the primary cable termination compartment. Each surge arrester shall be rated as follows:

- Rated surge arrester voltage (kVrms) 3.0
- Maximum Continuous Operating Voltage (kVrms) 2.55
- Maximum 0.5 μ s Discharge Voltage kV crest 7.8
- Maximum Discharge Voltage (20kA) kV crest 10.9

8.13.2 Each surge arrester shall have a stainless steel rating plate securely attached near the mounting base containing the following information:

- Manufacturer's Name and Address
- Surge Arrester Type, Catalogue Number & Serial Number
- Rated Maximum Voltage
- Rated Maximum Continuous Operating Voltage (MCOV)
- Pressure Relief Amperes
- Rated Frequency
- Classification
- Altitude Rating
- Customer Order Number and Date of Manufacture

9. TOOLS AND ACCESSORIES

9.1 Supply a list and prices of a complete set of all special tools that may be required for the normal and proper maintenance of the equipment supplied.

10. FACTORY TESTS

10.1 All individual components shall be completely tested in accordance with the relevant standards prior to installation in the cubicle.

10.2 The completed switchgear shall be fully tested in accordance with Section 5.3 (Production Tests) of EEMAC G8-3.2, latest edition. Three copies of the design test reports of Article 5.2 of EEMAC G8-3.2 shall be provided prior to shipping.

10.3 Advise the Engineer 14 days prior to the tests so that those tests may be witnessed by the Owner and his Engineer.

11. CONSTRUCTION DOCUMENTS

11.1 Manufacturer's Drawings

11.1.1 Submit unit substation drawings for review showing assembly, foundation and details. Layout drawings shall show anchor bolts, openings for cable entry, and all pertinent foundation loading details.

11.1.2 Submit Three Phase AC Schematic Diagrams, Wiring Diagrams and bills of materials for review.

11.2 Operation and Maintenance Manuals

11.2.1 Instruction manuals submitted for review shall describe in detail the construction and recommended procedures for assembling, dismantling, maintaining, and operating all equipment and listing all replacement parts. These shall include copies of all pertinent bulletins and instructions prepared by the manufacturers of component parts of the equipment properly catalogued for easy reference.

11.2.2 Instruction manuals shall also include all shop drawings provided by the manufacturer.

12. DRAWING LIST

The following drawings are provided and form part of this Specification:

<u>Drawing No.</u>	<u>Rev.</u>	<u>Title</u>
001-223-SK01	A02	Parks Canada 150kVA, 4160V-600V Integrated Unit Substation Assembly Single Line Diagram

SECTION B
SCHEDULES

**SPECIFICATION
SECTION B**

SCHEDULES

Complete and submit schedules contained in this section to the Project Authority after contract award.

SCHEDULE No. 1

TECHNICAL INFORMATION

1. 4160V Switchgear

- | | | |
|----|--|----------------|
| .1 | <u>Reference Data:</u> | _____ |
| | Manufacturer | _____
_____ |
| - | Designation or Catalogue No. | |
| | Type | |
| | Mechanism | |
| .2 | <u>Voltage Rating:</u> | |
| | Rated nominal voltage | kV rms _____ |
| | Rated maximum voltage | kV rms _____ |
| .3 | <u>Frequency:</u> | |
| | Rated power frequency | Hz _____ |
| .4 | <u>Current Ratings:</u> | |
| | Rated continuous current
at 40°C ambient | A rms _____ |
| | Rated short circuit fault
capacity @ 4.16kV (Symmetrical) | MVA _____ |
| | Rated short time current (1 sec) | kA rms _____ |
| | Rated momentary current | kA rms _____ |

SPECIFICATION

SCHEDULE No. 1 (Cont'd)

Complete and submit schedules contained in this section to the Project Authority after contract award.

TECHNICAL INFORMATION

1. 4160V Switchgear (Cont'd):

.5 Rated Insulation Levels:

Impulse withstand voltage	kV crest	_____
Power frequency withstand voltage (1 min)	kV rms	_____
Rated corona extinction voltage	kV rms	_____

.6 Power Fuses:

Fuse Type and Manufacturer		_____
Fuse Voltage Rating	kV rms	_____
Fuse Current Rating	A rms	_____

.7 Surge Arresters:

Arrester Type and Manufacturer		_____
Arrester Voltage Rating	kV rms	_____
Arrester MCOV	kV rms	_____

.8 Structural Data:

Overall dimensions of each switchgear cell:

- Height	mm	_____
- Width	mm	_____
- Depth	mm	_____
- Draw-out clearance	mm	_____
- Weight	kg	_____

SPECIFICATION

SCHEDULE No. 1 (Cont'd)

TECHNICAL INFORMATION

Complete and submit schedules contained in this section to the Project Authority after contract award.

2. 4160V-600V Power Transformer

.1	Quantity		_____
.2	Manufacturer		_____
.3	Type		_____ _____
.4	Rated capacity at low voltage terminals at 65°C rise:	kVA	_____ _____
.5	Rated primary voltage	V rms	_____
.6	Rated secondary voltage	V rms	_____
.7	Guaranteed positive sequence impedances, Z_1 on rated kVA base, at 85°C and mid tap	H-L %	_____ _____
.8	Winding material		_____
.9	Vector group		_____
.10	Rated lightning impulse withstand voltage:		
	- Primary winding	kV crest	_____
	- Secondary winding	kV crest	_____
.11	Taps:		
	- Type		_____
	- Number of taps		_____

SPECIFICATION

SCHEDULE No. 1 (Cont'd)

TECHNICAL INFORMATION

.12 Transformer Weights, Dimensions, and Miscellaneous:

Overall height	m	_____
Overall width	m	_____
Overall length	m	_____
Weight of core and coils	kg	_____

3. MANUFACTURER'S DOCUMENTS

.1 Drawings:

Drawing size	_____
AutoCad Revision No.	_____
Number of copies for review	_____
Number of copies for records (As Built Set)	_____

.2 Operation and Maintenance Manuals:

Number of copies for review	_____
Number of copies for records (As Built Set)	_____

.3 Test Results:

Number of copies for review	
Number of copies for records (As Built Set)	_____

The information below will be provided to the Project Manager by the successful contractor after contract award.

Drawing or Document Ref. No.

Completed Schedules _____

Outline dimensions and layout of equipment and enclosures _____

Bills of Material _____

Catalogues _____

Instruction Pamphlets _____

Painting Procedure Specification _____

Certified "Type Test" Reports (including list of Type Tests to be performed) _____

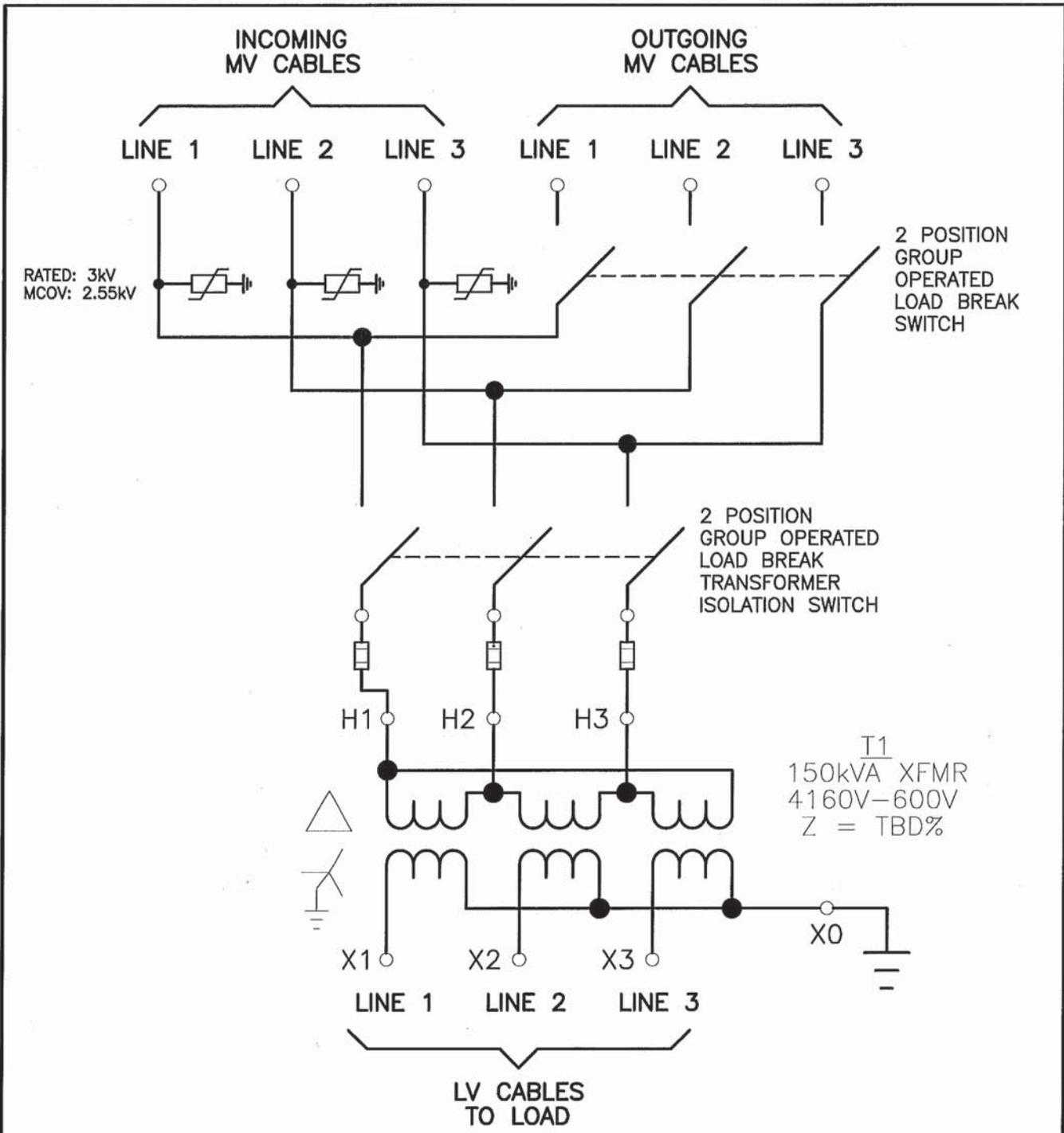
Bar chart progress schedule showing manufacture, delivery, issue of drawings, and all phases of the work _____

Transportation method and route (including details of trailer and wheel loading) _____

COMMENCEMENT AND COMPLETION DATES

The information below will be provided to the Project Manager by the successful contractor after contract award.

	<u>Required Dates</u>
1. Submit Bills of Material and Planning Schedule for review.	-
2. Submit assembly drawings, foundation and base plate details, layout and drilling details, single line diagrams, wiring diagrams, control schematics and drawings for review.	-
3. Submit performance curves and other supporting documentation.	-
4. Submit final copies of shop drawings	-
5. Submit draft copies of Operation and Maintenance Manuals.	-



STRUM ENGINEERING ASSOCIATES LTD.

DARTMOUTH & SYDNEY
NOVA SCOTIA

DRAWN	J.B.
CKD	-
P.MGR.	B. PICKUP
QA/QC	
SCALE	N.T.S.
DATE (YYYY-MM-DD)	2015-07-15

CLIENT	PARKS CANADA LOUISBOURG, NS
TITLE	150kVA, 4160V-600V INTEGRATED UNIT SUBSTATION ASSEMBLY THREE LINE DIAGRAM

REF. DWGS.	
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DWG. No.	001-223-1-15-SK01
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REV.	A02
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