Public Works and Government Services Canada | Travaux publics et Services gouvernementaux Canada

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RETOURNER LES SOUMISSIONS À:

Public Works and Government Services Canada
ATB Place North Tower
10025 Jasper Ave./10025 ave. Jaspe
5th floor/5e étage
Edmonton
Alberta
T5J 1S6
Bid Fax: (780) 497-3510

SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Public Works and Government Services Canada
ATB Place North Tower
10025 Jasper Ave./10025 ave Jasper
5th floor/5e étage
Edmonton
Alberta
T5J 1S6

Title - Sujet TRANSFORMERS	
Solicitation No. - N° de l'invitation EP922-180091/A	**Amendment No. - N° modif.** 003
Client Reference No. - N° de référence du client EP922-180091	**Date** 2017-08-30
GETS Reference No. - N° de référence de SEAG PW-$EDM-064-11143	
File No. - N° de dossier EDM-7-40023 (064)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à** 02:00 PM **on - le** 2017-09-05	**Time Zone** **Fuseau horaire** Mountain Daylight Saving Time MDT
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Scott, Dallas	**Buyer Id - Id de l'acheteur** edm064
Telephone No. - N° de téléphone (780) 224-7200 ( )	**FAX No. - N° de FAX** (780) 497-3510
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:** Agriculture and Agri-Food Canada Lethbridge Research Centre 5403 – 1 Ave South Lethbridge, Alberta T1J 4P4 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	**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**

Canada

This amendment is used to address solicitation EP922-180091/A as follows:

Question #1: Spec calls out for efficiency of 99.5%. It doesn't state at what load or temperature that this efficiency should be reached, so we need to know if we must stick to this.

Answer #1: The pertinent standard for minimum efficiency is CSA Standard C802.3-15. In this standard the determination of the minimum efficiency rating is set out. The tables in this standard do not precisely align with the transformer specified. For this reason the minimum efficiency requirement of 99.5 % was stipulated in the project specifications. It is a requirement.

Question #2: Spec calls for NEMA TP1 Standards which is not inclusive of a 5 mVA.

Answer #2: The pertinent standard for minimum efficiency is CSA Standard C802.3-15.The standard NEMA TP1 does not apply.

Question #3: In the Tender Issue Specifications, Section 26 12 19, Part 2. Products, point 10 indicates: "Mechanical interlock to Section 26 18 41 – Interlock Systems to prevent access to primary compartment unless primary supply is isolated at source". Section 26 18 41 is not included in the solicitation documents. Can you please provide it?

Answer #3: The interlock needs to be coordinated with the main service and switchgear which design is not yet finalized. At this time the interlock is to be deleted from the current requirements. It will be handled as a retro fit requirement in the work to install the transformers in their permanent future application.

At ANNEX "A", REQUIREMENT

DELETE: Tender Issue Specifications (2017-07-05)

INSERT: Tender Issue Specifications (2017-08-30)

If your proposal has already been submitted, you may wish to revise it. Revisions to your proposal must be submitted in a sealed envelope with the contents clearly identified on the outside of the envelope. Any revisions to your proposal must be received by the Bid Receiving Unit on or before the time and date stated on page 1 of this document. Any revisions to your proposal received after the closing date and time will be considered late and will be returned unopened.

ALL OTHER TERMS AND CONDITIONS REMAIN THE SAME AND ARE IN FULL EFFECT

PWGSC Project Number R.082782.001

Research Centre Main Transformer Supply

Lethbridge, AB

Tender Issue Specifications

Table of Contents

2017-08-30

Part 1 General

1.1 RELATED REQUIREMENTS

NOT USED.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the supply only of two Pad Mount Liquid-filled 5MVA, 25kV/346/600V three-phase four-wire transformers for future use in the upgrade of the main service to the AAFC – Lethbridge Research Station. The new transformers are to be taken into storage on the project site, to be available as temporary replacement of existing in-service equipment. In future, the pair of transformers will be used in an all-new, fully redundant main service for the facility, which will replace the existing service.

.2 Prior to the transformers being removed from storage and placed into service, it is the responsibility of the manufacturer to advise the Departmental Representative with respect to the pre-installation inspection of the equipment and provide any pre-service testing required to comply with the terms of the manufacturer's warranty. In addition, specific instructions related to the handling, storage, start-up and commissioning of the transformers are to be provided as, and when, requested by the Departmental Representative for use in the temporary and permanent installation of the transformers.

1.3 CONTRACT METHOD

.1 Construct Work under stipulated price contract.

1.4 WORK BY OTHERS

NOT USED.

1.5 FUTURE WORK

.1 Project is designed for future use of supplied equipment as described in 1.2.1 of this section.

1.6 WORK SEQUENCE

NOT USED.

1.7 CONTRACTOR USE OF PREMISES

.1 Coordinate delivery with the Departmental Representative.

1.8 OWNER OCCUPANCY

NOT USED.

1.9 PARTIAL OWNER OCCUPANCY

NOT USED.

1.10 PRE-ORDERED PRODUCTS/PRE-BID WORK

NOT USED**.**

1.11 PRE-PURCHASED EQUIPMENT

NOT USED.

1.12 OWNER FURNISHED ITEMS

NOT USED**.**

1.13 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

NOT USED.

1.14 EXISTING SERVICES

NOT USED.

1.15 DOCUMENTS REQUIRED

NOT USED.

Part 2 Products

NOT USED.

Part 3 Execution

3.1

.1 It is intended that the transformers will remain in storage on site in the powerhouse until AAFC is able to proceed with the construction of the new Main Transformer in future. It is expected that a warranty plan can be managed to incorporate the actual in-service date. Should failure of the existing on-site transformers occur and one of the new transformers be required as a temporary replacement, this will trigger the commencement of the in-service portion of the warranty period for that transformer.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 Common Work Results For Electrical.

1.2 REFERENCE STANDARDS

NOT USED.

1.3 ADMINISTRATIVE – POST-TENDER CONTRACT EXECUTION

.1 During execution of the work, submit to Departmental Representative submittals listed for review. Submit within four weeks of the execution of the work and in orderly sequence to not cause delay in Work. Failure to submit within four weeks is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units, converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Contracting Authority, in writing at time of providing submittal documents, identifying any adjustments to previously submitted Contract Documents and stating reasons for adjustments.

.7 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

1.4 SHOP DRAWINGS AND PRODUCT DATA

.1 Refer to General Conditions in Contract.

.2 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.3 Submit drawings stamped and signed by professional engineer registered or licensed in Alberta, Canada.

.4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment,

indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.5 Allow 10 days for review of each submission.

.6 Review comments made on shop drawings by Departmental Representative are not intended to change Contract Price. If review comments affect value of Work, state such in writing to Contracting Authority prior to proceeding with Work.

.7 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative and Contracting Authority in writing of revisions other than those requested.

.8 Accompany submissions with transmittal letter, containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.9 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Dimensions and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.10 After Departmental Representative's review, distribute copies.

.11 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.12 Submit electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.13 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 3 years of date of contract award for project.

.14 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.15 Submit electronic copies of manufacturer’s instructions for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.16 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

.17 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.18 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.19 Delete information not applicable to project.

.20 Supplement standard information to provide details applicable to project.

.21 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication of Work may proceed.

1.5 SAMPLES

NOT USED.

1.6 MOCK-UPS

NOT USED.

1.7 PHOTOGRAPHIC DOCUMENTATION

NOT USED.

1.8 CERTIFICATES AND TRANSCRIPTS

NOT USED.

Part 2 Products

NOT USED.

Part 3 Execution

NOT USED.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

NOT USED.

1.2 REFERENCE STANDARDS

NOT USED.

1.3 INSPECTION

.1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.3 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies may be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.

1.5 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off-site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.6 PROCEDURES

NOT USED.

1.7 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.8 REPORTS

.1 Submit 4 copies of inspection and test reports to Departmental Representative.

1.9 TESTS AND MIX DESIGNS

NOT USED.

1.10 MOCK-UPS

NOT USED.

1.11 MILL TESTS

NOT USED.

1.12 EQUIPMENT AND SYSTEMS

NOT USED.

Part 2 Products

NOT USED.

Part 3 Execution

NOT USED.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

NOT USED.

1.2 REFERENCE STANDARDS

.1 Within text of each specifications section, reference may be made to reference standards.

.2 Conform to these reference standards, in whole or in part as specifically requested in specifications.

.3 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.

.4 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.3 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.4 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

.5 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.6 TRANSPORTATION

.1 Pay costs of transportation of products required in performance of Work.

1.7 NOT USED

1.8 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

1.9 CO-ORDINATION

NOT USED.

1.10 CONCEALMENT

NOT USED.

1.11 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.12 LOCATION OF FIXTURES

NOT USED.

1.13 FASTENINGS

NOT USED.

1.14 FASTENINGS - EQUIPMENT

NOT USED.

1.15 PROTECTION OF WORK IN PROGRESS

NOT USED.

1.16 EXISTING UTILITIES

NOT USED.

Part 2 Products

NOT USED.

Part 3 Execution

NOT USED.

END OF SECTION

Part 1 General

1.1 NOT USED

1.2 NOT USED

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Participate in meeting by telephone call with Departmental Representative and Consultant to:

.1 Verify Project requirements.

.2 Review warranty requirements and manufacturer's installation instructions.

.2 Departmental Representative to establish communication procedures for:

.1 Notifying construction warranty defects.

.2 Determine priorities for type of defects.

.3 Determine reasonable response time.

.3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.

.4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative four final copies of operating and maintenance manuals in English.

.3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.

.4 Provide evidence, if requested, for type, source and quality of products supplied.

1.5 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.4 Arrange content under Section numbers and sequence of Table of Contents.

.5 Text: manufacturer's printed data, or typewritten data.

.6 Drawings: provide with reinforced punched binder tab.

.1 Bind in with text; fold larger drawings to size of text pages.

1.6 CONTENTS - PROJECT RECORD DOCUMENTS

.1 Table of Contents for Each Volume: provide title of project;

.1 Date of submission; names.

.2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.

.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data.

.1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

1.7 NOT USED

1.8 NOT USED

1.9 NOT USED

1.10 NOT USED

1.11 NOT USED

1.12 MAINTENANCE MATERIALS

.1 Spare Parts:

.1 Provide spare parts, in quantities specified in individual specification sections.

.2 Provide items of same manufacture and quality as items in Work.

.3 Deliver to site; place and store.

.4 Receive and catalogue items.

.1 Submit inventory listing to Departmental Representative.

.2 Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit prior to final payment.

1.13 DELIVERY, STORAGE AND HANDLING

.1 Store spare parts and maintenance materials in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and for review by Departmental Representative.

1.14 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties. It is intended that the transformers will remain in storage until AAFC is able to proceed with the construction of the new Main Transformer in future. It is expected that a warranty plan can be managed to incorporate the actual in-service date. Should failure of the existing on-site transformers occur and one of the new transformers be required as a temporary replacement, this will trigger the warranty period commencement.

.2 Submit warranty management plan to Departmental Representative for approval.

.3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Departmental Representative for approval.

.6 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until in-service date is determined.

.7 Conduct joint 4-month and 9-month warranty inspections, measured from time of in-service acceptance, by Departmental Representative.

.8 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Provide:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where delivered.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty subject to item 1.14.1 of this section.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.3 Please for 4- and 9-month post-construction warranty inspections.

.4 Procedure and status of tagging of equipment covered by extended warranties.

.5 Provide copies of instructions, which need to be posted, near equipment where operation is critical for warranty and/or safety reasons.

.9 Respond in timely manner to oral or written notification of required warranty work.

.10 Written verification to follow oral instructions.

.1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.15 WARRANTY TAGS

.1 Provide tags for use at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Departmental Representative.

.2 Leave date of acceptance until equipment is placed in service.

.3 Indicate following information on tag:

.1 Type of product.

.2 Model number.

.3 Serial number.

.4 Contract number.

.5 Warranty period.

.6 Inspector's signature.

.7 Construction Contractor.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

1.2 REFERENCES

.1 Definitions:

.1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.

.2 Reference Standards:

.1 CSA Group

.1 CSA C22.1-15, Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.

.2 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)

.1 IEEE Std 100-2000, The Authoritative Dictionary of IEEE Standards Terms, Seventh Edition.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for Pad Mount Transformers and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in the province of Alberta, Canada.

.2 Indicate clearances for operation, maintenance, and replacement of operating equipment devices.

.3 If changes are required, notify Departmental Representative of these changes before they are made.

.4 Certificates:

.1 Provide CSA-certified equipment.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for Pad Mount Transformers for incorporation into manual.

.1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.

.2 Operating instructions to include following:

.1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.

.2 Start up, proper adjustment, operating, lubrication, and shutdown procedures.

.3 Safety precautions.

.4 Procedures to be followed in event of equipment failure.

.5 Other items of instruction as recommended by manufacturer of each system or item of equipment.

.3 Print or engrave operating instructions and frame in approved laminated plastic.

.4 For operating instructions exposed to weather, provide weather-resistant materials or weatherproof enclosures.

.5 Ensure operating instructions will not fade when exposed to sunlight and are secured to prevent easy removal or peeling.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section [01 61 00 - Common Product Requirements] [with manufacturer's written instructions].

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect Pad Mount Transformers from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DESIGN REQUIREMENTS

.1 Operating voltages: to CAN3-C235.

.2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.

.1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

.3 Language operating requirements: provide identification nameplates and labels in English.

2.2 MATERIALS AND EQUIPMENT

.1 Provide equipment in accordance with Section 01 61 00 - Common Product Requirements.

.2 Equipment to be CSA certified.

.3 Factory assemble control panels and component assemblies.

2.3 NOT USED

2.4 WARNING SIGNS

.1 Warning Signs: in accordance with requirements of Departmental Representative.

.2 Decal signs, minimum size 175 x 250 mm.

2.5 WIRING TERMINATIONS

.1 Ensure lugs, terminals, screws used for termination of wiring are suitable for either copper or aluminum conductors.

.2 Provide colour-coding bands for all conductors.

2.6 EQUIPMENT IDENTIFICATION

.1 Identify electrical equipment with [nameplates] [labels] as follows:

.1 Nameplates: lamicoid, black face, white core, lettering accurately aligned and engraved into core, mechanically attached with self-tapping screws.

.2 Nameplate sizes as follows: 25 x 100 mm, 2 lines, 6 mm high letters.

.2 Labels: embossed plastic labels with 6 mm high letters unless specified otherwise.

.3 Wording on nameplates and labels to be approved by Departmental Representative prior to manufacture.

.4 Allow for minimum of twenty-five (25) letters per nameplate or label.

.5 Transformers: indicate capacity, primary and secondary voltages.

2.7 NOT USED

2.8 FINISHES

.1 Shop finish metal enclosure surfaces by application of rust-resistant primer inside and outside, and at least two coats of finish enamel.

.1 Paint outdoor electrical equipment "equipment green" finish.

Part 3 Execution

3.1 NOT USED

3.2 NOT USED

3.3 NAMEPLATES AND LABELS

.1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.4 NOT USED

3.5 NOT USED

3.6 NOT USED

3.7 NOT USED

3.8 NOT USED

3.9 SYSTEM STARTUP

.1 Instruct Departmental Representative in operation, care and maintenance of systems, system equipment and components.

.2 Instruct Departmental Representative concerning needs for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel.

3.10 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

NOT USED.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers, Inc. (IEEE)

.1 ANSI/IEEE 386, Separable Insulated Connector Systems for Power Distribution Systems above 600 V, 2016.

.2 EEMAC L9-3, Interchangeability of HV Bushings on Pole Type Distribution Transformers, 1987.

.3 IEEE Std C57.12.00™ standard – Standard for Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers, 2015.

.4 IEEE Std C57.12.28™ standard – Pad-Mounted Equipment - Enclosure Integrity, 2014.

.5 IEEE Std C57.12.90™ standard – Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers and IEEE Guide for Short-Circuit Testing of Distribution and Power Transformers, 2015.

.6 IEEE Std C57.12.91™ standard – Guide for Loading Mineral-Oil-Immersed Transformers, 2011.

.2 Canadian Standards Association (CSA International)

.1 CAN/CSA-C2.1- Single-Phase and Three-Phase Distribution Transformers, Types ONAN and LNAN, 2017.

.2 CAN/CSA-C227.2, Three-Phase, Live Front, Pad Mounted Distribution Transformers, 2013.

.3 CAN/CSA-C227.3, Low-Profile, Single-Phase, Dead Front, Pad-Mounted Distribution Transformers, 2003.

.4 CSAC227.4, Three-Phase Dead Front Pad-Mounted Distribution Transformers, 2017.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, and limitations.

.3 Submit shop drawings and indicate:

.1 Anchoring method and dimensioned foundation template.

.2 Dimensioned cable entry locations.

.3 Dimensioned cable termination height.

.4 Identified internal and external component layout on assembly drawing.

.5 Insulating liquid capacity.

.6 Submit primary fuse and secondary breaker time-current characteristics.

1.4 QUALITY CONTROL

.1 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 – Quality Control.

.1 Certificates: submit production certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.2 Instructions: submit manufacturer's installation instructions.

.1 Departmental Representative will make available 1 copy of systems supplier's installation instructions.

1.5 CLOSEOUT SUBMITTALS

.1 Provide operation and maintenance data for pad mounted distribution transformers for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Include insulating liquid maintenance data.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Ship transformer complete with first fill of liquid.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer' name and address.

Part 2 Products

2.1 EQUIPMENT

.1 Three phase pad mounted transformers: to CAN/CSA-C227.2.

.2 Three-phase dead front pad-mounted distribution transformers manufactured to CSA C227.4.

.3 Separable insulated connectors for power distribution systems above 600 V manufactured to ANSI/IEEE 386.

.4 Oil-filled pad-mounted distribution transformers complete with primary and secondary cable compartments, un-fused options and accessories to form complete factory assembled, self-contained, steel fabricated for mounting on concrete pad.

.5 High-voltage bushings or high voltage bushing wells for connection to distribution system through separable insulated connectors for dead front operation solderless connectors.

.6 Separable insulated connectors.

.7 Primary cable terminals with hole for 9.5 mm diameter, 16-thread bolt for attachment of solder lug or clamp connector in vertical plane with solderless connectors.

.8 Spade type low-voltage terminals.

.9 Connectors for primary and secondary cables.

.10 Stays to hold compartment doors in 110 degrees open position.

2.2 TRANSFORMER CHARACTERISTICS

.1 Primary voltage: 25 kV, 60 Hz, delta connected, three-phase, grounded.

.2 Secondary voltage: 347/600V, wye connected, three-phase, 4 wire, neutral grounded.

.3 Capacity: 5000/6250 kVA.

.4 Basic impulse level: 125 kV.

.5 Maximum rms short-circuit: 250 MVA

.6 Impedance: not less than 7%.

.7 Efficiency: greater than 99.5%

.8 The average winding temperature rise above ambient temperature, when tested the base transformer rating, shall not exceed 55 °C, and when tested at 112% of the base rating, shall not exceed 65 °C.

.9 High Performance transformers designed to deliver more energy savings under either linear or non-linear loading that maintains high efficiency levels over the entire load range.

.10 Linear load losses at the transformer's peak design loading and harmonic losses shall be reduced to ensure efficiencies meet NEMA TP-1 requirements even under 'non-linear loading.

.11 For non-linear loading applications ensure the proven harmonic mitigating providing energy efficiency, low inrush and low audible noise.

2.3 VOLTAGE TAPS

.1 The transformer will be furnished with full capacity high-voltage taps. The tap changer shall be clearly labeled to reflect that the transformer must be de-energized before operating the tap changer as required in Section 4.3 of IEEE Std C57.12.34™-2009 standard. The unit shall have two 2 ½% taps above and two 2 ½% below rated voltage (split taps).

2.4 CONSTRUCTION

.1 The core and coil shall be vacuum processed to ensure maximum penetration of insulating fluid into the coil insulation system. While under vacuum, the windings will be energized to heat the coils and drive out moisture, and the transformer will be filled with

preheated filtered degassed insulating fluid. The core shall be manufactured from burr-free, grain-oriented silicon steel and shall be precisely stacked to eliminate gaps in the corner joints. The coil shall be insulated with B-stage, epoxy coated, diamond pattern, insulating paper, which shall be thermally cured under pressure to ensure proper bonding of conductor and paper. Coils shall be copper.

.2 The dielectric coolant shall be listed less-flammable fluid meeting the requirements of Canadian Electrical Code. The dielectric coolant shall be non-toxic*, non-bio-accumulating and be readily and completely biodegradable. The base fluid shall be 100% derived from edible seed oils and food grade performance enhancing additives. The fluid shall not require genetically altered seeds for its base oil. The fluid shall be Factory Mutual Approved®, ULC® Classified Dielectric Medium and ULC® Classified Transformer Fluid.

.3 Tank and Cabinet Enclosure

.1 Provide NEMA 4X steel enclosures housing the high and low voltage bushing. The high-voltage and low-voltage compartments, separated by a metal barrier, shall be located side-by-side on one side of the transformer tank. Each compartment shall have a door that is constructed so as to provide access to the high-voltage compartment only after the door to the low-voltage compartment has been opened. There shall be one or more additional fastening devices that must be removed before the high-voltage door can be opened. Where the low-voltage compartment door is of a flat panel design, the compartment door shall have three-point latching with a handle provided for a locking device. Hinge pins and associated barrels shall be constructed of corrosion-resistant material, passivated ANSI® Type 304 or the equivalent.

.2 A recessed, captive, penta-head or hex-head bolt that meets the dimensions per IEEE Std C57.12.28™-2014 standard shall secure all access doors.

.3 The compartment depth shall be in accordance with IEEE Std C57.12.34™-2009 standard, unless additional depth is specified.

.4 The tank base must be designed to allow skidding or rolling in any direction. Lifting provisions shall consist of four lifting lugs welded to the tank.

.5 Provide lifting lugs on the core and other components of the transformer for detanking purposes. Placement of the lugs will not cause damage to the components during lifting.

.6 The tank shall be constructed to withstand 7 psi without permanent deformation, and 15 psi without rupture. The tank shall include a 15 psig pressure relief valve with a flow rate of minimum 35 SCFM.

.7 The exterior of the unit shall be painted Munsell 7GY3.29/1.5 green (STD). If a special paint color is specified, a federal spec number or paint chip must be provided at the time of order. The cabinet interior and front plate shall be painted gray for ease of viewing the inside compartment.

.8 The tank shall be complete with an anodized aluminum laser engraved nameplate. This nameplate shall meet Nameplate B per IEEE Std C57.12.00™-2010 standard.

.9 High voltage bushings will be installed in the high voltage termination compartment located on the front left of the transformer and requiring access via the low voltage termination compartment on the front right.

.10 The transformer shall be provided with three (3) high-voltage bushings in accordance with Figure 1 dimensions (Figure 4a dimensions may be specified when a larger termination compartment for greater working space is desired) from IEEE Std C57.12.34™-2009 standard for radial feed configurations. The bushing heights shall be in accordance with Figure 3 dimensions (Figure 6 dimensions may be specified for greater bushing height) of IEEE Std C57.12.34™-2009 standard.

.11 Low-voltage connection to be 6000A bus bar for underground connections include flexible connectors between transformer low-voltage studs and bus bars.

.12 Transformer to be floor mounted on steel skid complete with vibration isolation dampers. Submit detail of vibration dampers for approval.

.4 Grounding to the core shall be provided.

2.5 ACCESSORIES

.1 Additional transformer rating nameplate – In addition to the standard nameplate located on the transformer tank, a second nameplate shall be included. The nameplate shall be mounted external to the termination compartments with an industrial grade double-sided adhesive. Its location shall be identified on the data sheet.

.2 External drain valve with sampler – A 1.0” drain valve with sampling device shall be located outside of the cable compartment on the low voltage side of the tank. The valve shall be protected by a hinged cover with padlock provisions.

.3 External instrumentation package – All included gauges and instrumentation devices shall be located outside of the cable compartments such that access to them does not require exposure to any live circuits. They shall be located inside a separate NEMA® 4 rated enclosure on the high voltage side of the tank. Devices shall include the following:

.1 Oil level indicator (with contacts for remote alarm/trip),

.2 Oil temperature indicator (with contacts),

.3 Top pressure relief valve,

.4 Bottom drain and sample valve,

.5 Top bung for oil filling,

.6 Winding temperature indicator (with contacts),

.7 The first stage cooling fans and controls,

.8 Control cabinet with anti-condensation heater (NEMA 4X steel construction),

.9 Emergency pressure relief device,

.10 Top filter press connection,

.11 Top non-flammable insulating liquid sampling device,

.12 Anchor devices, setting templates means for bolting down,

.13 Sudden pressure relay,

.14 Separate 120V AC circuit for fans/heaters.

.4 Alarm contacts shall be included on the liquid level gauge, dial-type thermometer, and pressure/vacuum gauges. Any of the accessories above with contacts shall be wired to terminal blocks located within the enclosure.

.5 For additional safety and ease of maintenance, the following instrumentation devices shall be located on the front of the external load break switch compartment: liquid level gauge, dial-type thermometer, pressure/vacuum gauge, sound level, pressure relief valve and ½" fluid sampling valve. These devices shall be protected by a hinged cover with padlock provisions.

2.6 FINISH

.1 Thoroughly clean the equipment of all film, scale, rust, and weld splatters to base metal by means of sandblasting or equivalent methods, both inside and outside.

.2 Degrease and provide rust-inhibiting treatment to all surfaces.

.3 Immediately upon completion of the cleaning process, the surfaces are to be coated with one coat of primer.

.4 After application of the primer and before painting, all surfaces to be lightly sanding to ensure flatness and quality of the grinding around welds.

.5 All surfaces to be given two (2) coats of baked enamel.

.6 Thoroughly clean the transformer's interior of all construction debris.

.7 Provide 1 litre of touch-up paint per transformer.

2.7 TESTING

.1 The following tests to be performed in the factory, prior to shipment of transformer. Test results are to be supplied with the Operations and Maintenance manual.

.2 Note: The Departmental Representative may want to witness the factory testing. Notify the Engineer of the testing schedule at least four (4) weeks prior to the day of testing.

- .1 Resistance tests of all windings.
- .2 Ratio test at rated voltage and on all tap connections.
- .3 Polarity and phase relationship at the rated voltage connection.
- .4 No-load loss test.
- .5 Exciting current test at rated voltage.
- .6 Impedance and load test with thermographic analysis.
- .7 Dielectric frequency response, both for the bushings and windings.
- .8 Temperature rise test, to be detailed by the quotation.
- .9 60 Hz and lower frequency voltage tests to be described by the quotation.
- .10 The quotation is to include a description of the BIL tests available.

.3 The Departmental Representative shall perform the following field tests to provide the integrity of the equipment after transportation.

.1 Physical inspection.

.2 Transformer ratio, polarity, capacitance and dissipation factor tests, reverse excitation.

.3 Insulation resistance (Megger) test.

.4 Provide recommended Megger test levels with the delivery of the equipment. Also, specify if equipment should not be subjected to high-potential tests.

.5 Provide level of acceptable results for all field tests.

2.8 EQUIPMENT IDENTIFICATION

.1 Nameplate showing information in accordance with CSA C2.01 and CSA C88.

.2 Provide equipment identification by a permanently attached laminated plastic nameplate showing the equipment name/ number assigned by Owner. (To be provided at shop drawing review stage)

2.9 SPARE MAINTENANCE TOOLS

.1 Manufacturer to provide a list of recommended spare parts and maintenance tools. Include prices for individual components.

2.10 SOURCE QUALITY CONTROL

.1 Provide production test certificates to the Department Representative.

2.11 NOT USED

END OF SECTION