



**RETURN BIDS TO:**

**RETOURNER LES SOUMISSIONS À:**

Réception des soumissions - TPSGC / Bid

Receiving - PWGSC

1550, Avenue d'Estimauville

1550, D'Estimauville Avenue

Québec

Québec

G1J 0C7

**INVITATION TO TENDER**

**APPEL D'OFFRES**

**Tender 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.

**Soumission 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 et sur toute feuille ci-annexée, au(x) prix indiqué(s).

**Comments - Commentaires**

**Vendor/Firm Name and Address**

Raison sociale et adresse du  
fournisseur/de l'entrepreneur

**Issuing Office - Bureau de distribution**

TPSGC-PWGSC

601-1550, Avenue d'Estimauville

Québec

Québec

G1J 0C7

<b>Title - Sujet</b> Remplacement de la tour - Mingan	
<b>Solicitation No. - N° de l'invitation</b> EE517-170427/A	<b>Date</b> 2016-06-23
<b>Client Reference No. - N° de référence du client</b> EE517-170427	<b>GETS Ref. No. - N° de réf. de SEAG</b> PW-\$QCM-008-16793
<b>File No. - N° de dossier</b> QCM-6-39071 (008)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2016-07-14</b>	
<b>Time Zone</b> Fuseau horaire Heure Avancée de l'Est HAE	
<b>F.O.B. - F.A.B.</b>	
<b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Rochette, Jean	<b>Buyer Id - Id de l'acheteur</b> qcm008
<b>Telephone No. - N° de téléphone</b> (418) 649-2834 ( )	<b>FAX No. - N° de FAX</b> (418) 648-2209
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> Mingan, Québec, Canada	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

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

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## INVITATION TO TENDER

**Title :** REPLACEMENT OF A TELECOMMUNICATION TOWER

### IMPORTANT NOTICE TO BIDDERS

#### TENDER DOCUMENTS

Firms intending to submit tenders on this project should obtain tender documents through the website <https://www.achatsetventes-buyandsell.gc.ca/>

#### SUPPORT THE USE OF APPRENTICES

Through Canada's Economic Action Plan 2013, the Government of Canada proposes to support the employment of apprentices in federal construction and maintenance projects. Refer to SI10.

#### INTEGRITY PROVISIONS - BID

Changes have been made to the Integrity Provisions - Bid as of 2016-04-04. See GI01, Integrity Provision-Bid of R2710T of the General Instructions for more information.

#### LISTING OF SUBCONTRACTORS

As per GI07 of R2710T you should provide using Appendix 7 at Bid closing a list of Subcontractors that have 20% or more of the tendered price value.

#### PWGSC UPDATE ON ASBESTOS USE

Effective April 1, 2016, all Public Works and Government Services Canada (PWGSC) contracts for new construction and major rehabilitation will prohibit the use of asbestos-containing materials. Further information can be found at <http://www.tpsgc-pwgsc.gc.ca/comm/vedette-features/2016-04-19-00-eng.html>

#### NOMENCLATURE

Public Works and Government Services Canada (PWGSC) is now called Public Services & Procurement Canada (PSPC). Both names refer to the same organization and the use of either is accepted.

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SI10	Public Works and Government Services Canada, Apprentice Procurement Initiative
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### R2710T GENERAL INSTRUCTIONS - CONSTRUCTION SERVICES - BID SECURITY REQUIREMENTS (GI) (2016-04-04)

The following GI's are included by reference and are available at the following Web Site <https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R>

GI01	Integrity Provisions - Bid
GI02	Completion of Bid
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GI05	Capital Development and Redevelopment Charges
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### BID AND ACCEPTANCE FORM (BA)

Solicitation No – N° de l'invitation  
EE517-170239/A  
Client Ref No. – N° de réf. du client  
EE517-17-0239

Amd. No. – N° de la modif.  
File No. – N° du dossier  
QCM-6-39040

Buyer ID – id de l'acheteur  
qcm008

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BA01 Identification  
BA02 Business Name and Address of Bidder  
BA03 The Offer  
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BA05 Acceptance and Contract  
BA06 Construction Time  
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## **APPENDICES**

Appendix 1 Combined Price Form  
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Appendix 6 Voluntary Reports For Apprentices Employed During The Contract  
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Appendix 8 Listing of guyed tower projects

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## SPECIAL INSTRUCTIONS TO BIDDERS (SI)

### SI01 BID DOCUMENTS

1. The following are the bid documents:
  - a. Invitation to Tender - Page 1;
  - b. Special Instructions to Bidders;
  - c. General Instructions - Construction Services - Bid Security Requirements R2710T (2016-04-04)
  - d. Clauses & Conditions identified in "Contract Documents";
  - e. Drawings and Specifications;
  - f. Bid and Acceptance Form and related Appendix(s); and
  - g. Any amendment issued prior to solicitation closing.

Submission of a bid constitutes acknowledgement that the Bidder has read and agrees to be bound by these documents.

2. General Instructions - Construction Services - Bid Security Requirements R2710T is incorporated by reference and is set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is available on the PWGSC Web site: <https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R>

### SI02 ENQUIRIES DURING THE SOLICITATION PERIOD

1. Enquiries regarding this bid must be submitted in writing to [jean.rochette@tpsgc-pwgsc.gc.ca](mailto:jean.rochette@tpsgc-pwgsc.gc.ca), the Contracting Officer named on the Invitation to Tender - Page 1 as early as possible within the solicitation period. Except for the approval of alternative materials as described in G15 of R2710T, enquiries should be received no later than **7 calendar days** prior to the date set for solicitation closing to allow sufficient time to provide a response. Enquiries received after that time may not result in an answer being provided.
2. To ensure consistency and quality of the information provided to Bidders, the Contracting Officer shall examine the content of the enquiry and shall decide whether or not to issue an amendment.
3. All enquiries and other communications related to this bid sent throughout the solicitation period are to be directed **ONLY** to the Contracting Officer named on the Invitation to Tender - Page 1. Failure to comply with this requirement may result in the bid being declared non-responsive.

### SI03 OPTIONAL SITE VISIT

Not applicable

### SI04 REVISION OF BID

A bid may be revised by letter or facsimile in accordance with G10 of R2710T. The facsimile number for receipt of revisions is (418) 648-2209.

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## **SI05 BID RESULTS**

1. A public bid opening will be held in the office designated on the Front Page "Invitation to Tender" for the receipt of bids shortly after the time set for solicitation closing.
2. Following solicitation closing, bid results may be obtained by calling at number (418) 649-2888.

## **SI06 INSUFFICIENT FUNDING**

In the event that the lowest compliant bid exceeds the amount of funding allocated for the Work, Canada in its sole discretion may

- a. cancel the solicitation; or
- b. obtain additional funding and award the Contract to the Bidder submitting the lowest compliant bid; and/or
- c. negotiate a reduction in the bid price and/or scope of work of not more than 15% with the Bidder submitting the lowest compliant bid. Should an agreement satisfactory to Canada not be reached, Canada shall exercise option (a) or (b).

## **SI07 BID VALIDITY PERIOD**

1. Canada reserves the right to seek an extension to the bid validity period prescribed in BA04 of the Bid and Acceptance Form. Upon notification in writing from Canada, Bidders shall have the option to either accept or reject the proposed extension.
2. If the extension referred to in paragraph 1. of SI07 is accepted, in writing, by all those who submitted bids, then Canada shall continue immediately with the evaluation of the bids and its approvals processes.
3. If the extension referred to in paragraph 1. of SI07 is not accepted in writing by all those who submitted bids then Canada shall, at its sole discretion, either
  - a. continue to evaluate the bids of those who have accepted the proposed extension and seek the necessary approvals; or
  - b. cancel the invitation to tender.
4. The provisions expressed herein do not in any manner limit Canada's rights in law or under GI11 of R2710T.

## **SI08 CONSTRUCTION DOCUMENTS**

The successful Contractor will be provided with one paper copy of the sealed and signed drawings, the specifications and the amendments upon acceptance of the offer. Additional copies, up to a maximum two (2), will be provided free of charge upon request by the Contractor. Obtaining more copies shall be the responsibility of the Contractor including costs.

## **SI09 INDUSTRIAL SECURITY RELATED REQUIREMENTS**

Not applicable

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## SI10 PUBLIC WORKS AND GOVERNMENT SERVICES CANADA APPRENTICE PROCUREMENT INITIATIVE

1. To encourage employers to participate in apprenticeship training, Contractors bidding on construction and maintenance contracts by Public Works and Government Services Canada (PWGSC) are being asked to sign a voluntary certification, signaling their commitment to hire and train apprentices.
2. Canada is facing skills shortages across various sectors and regions, especially in the skilled trades. Equipping Canadians with skills and training is a shared responsibility. In Economic Action Plan (EAP) 2013, the Government of Canada made a commitment to support the use of apprentices in federal construction and maintenance contracts. Contractors have an important role in supporting apprentices through hiring and training and are encouraged to certify that they are providing opportunities to apprentices as part of doing business with the Government of Canada.
3. Through the Economic Action Plan 2013 and support for training programs, the Government of Canada is encouraging apprenticeships and careers in the skilled trades. In addition, the government offers a tax credit to employers to encourage them to hire apprentices. Information on this tax measure administered by the Canada Revenue Agency can be found at: [www.cra-arc.gc.ca](http://www.cra-arc.gc.ca). Employers are also encouraged to find out what additional information and supports are available from their respective provincial or territorial jurisdiction.
4. Signed certifications (Appendix 4) will be used to better understand contractor use of apprentices on Government of Canada maintenance and construction contracts and may inform future policy and program development.
5. The Contractor hereby certifies the following:

In order to help meet demand for skilled trades people, the Contractor agrees to use, and require its subcontractors to use, reasonable commercial efforts to hire and train registered apprentices, to strive to fully utilize allowable apprenticeship ratios \* and to respect any hiring requirements prescribed by provincial or territorial statutes

The Contractor hereby consents to this information being collected and held by PWGSC, and Employment and Social Development Canada to support work to gather data on the hiring and training of apprentices in federal construction and maintenance contracts.

To support this initiative, a voluntary certification signaling the Contractor's commitment to hire and train apprentices is available at Appendix 4.

If you accept fill out and sign Appendix 4

*\* The journeyperson-apprentice ratio is defined as the number of qualified/certified journeypersons that an employer must employ in a designated trade or occupation in order to be eligible to register an apprentice as determined by provincial/territorial (P/T) legislation, regulation, policy directive or by law issued by the responsible authority or agency.*

## SI11 WEB SITES

The connection to some of the Web sites in the solicitation documents is established by the use of hyperlinks. The following is a list of the addresses of the Web sites:

Treasury Board Appendix L, Acceptable Bonding Companies  
<http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=14494&section=text#appl>

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Buy and Sell <https://www.achatsetventes-buyandsell.gc.ca>

Canadian economic sanctions <http://www.international.gc.ca/sanctions/index.aspx?lang=eng>

Contractor Performance Evaluation Report (Form PWGSC-TPSGC 2913)  
<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/2913.pdf>

Bid Bond (form PWGSC-TPSGC 504) <http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/504.pdf>

Performance Bond (form PWGSC-TPSGC 505) <http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/505.pdf>

Labour and Material Payment Bond (form PWGWSC-TPSGC 506)  
<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/documents/506.pdf>

Standard Acquisition Clauses and Conditions (SACC) Manual  
<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R>

PWGSC, Industrial Security Services <http://ssi-iss.tpsgc-pwgsc.gc.ca/index-eng.html>

PWGSC, Code of Conduct and Certifications  
<http://www.tpsgc-pwgsc.gc.ca/app-acq/cndt-cndct/contexte-context-eng.html>

Construction and Consultant Services Contract Administration Forms Real Property Contracting  
<http://www.tpsgc-pwgsc.gc.ca/app-acq/forms/formulaires-forms-eng.html>

Declaration Form  
<http://www.tpsgc-pwgsc.gc.ca/ci-if/formulaire-form-eng.html>

## **SI12 FINANCIAL BID**

The total amount of the bid excludes taxes

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## **SUPPLEMENTARY CONDITIONS (SC)**

### **SC01 INSURANCE TERMS**

#### 1) Insurance Contracts

- (a) The Contractor must, at the Contractor's expense, obtain and maintain insurance contracts in accordance with the requirements of the Certificate of Insurance. Coverage must be placed with an Insurer licensed to carry out business in Canada.
- (b) Compliance with the insurance requirements does not release the Contractor from or reduce its liability under the Contract. The Contractor is responsible for deciding if additional insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any additional insurance coverage is at the Contractor's expense, and for its own benefit and protection.

#### 2) Period of Insurance

- (a) The policies required in the Certificate of Insurance must be in force from the date of contract award and be maintained throughout the duration of the Contract.
- (b) The Contractor must be responsible to provide and maintain coverage for Products/Completed Operations hazards on its Commercial General Liability insurance policy, for a period of six (6) years beyond the date of the Certificate of Substantial Performance.

#### 3) Proof of Insurance

- (a) Before commencement of the Work, and no later than thirty (30) days after acceptance of its bid, the Contractor must deposit with Canada a Certificate of Insurance on the form attached herein.
- (b) Upon request by Canada, the Contractor must provide originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the Certificate of Insurance (Appendix 5).

#### 4) Insurance Proceeds

In the event of a claim, the Contractor must, without delay, do such things and execute such documents as are necessary to effect payment of the proceeds.

#### 5) Deductible

The payment of monies up to the deductible amount made in satisfaction of a claim must be borne by the Contractor.

### **SC02 MANDATORY CRITERIA**

The guyed Steel Communication Tower manufacturer shall have completed successfully the fabrication of a minimum of ten (10) guyed steel radio communication towers of 40 meters in height or greater within the past five (5) years where the fabrication and supervision of field erection of the tower was asked. Fill out and attach to your bib the table in Appendix 8 for the 10 projects. Upon request, provide the relevant documentation with regards to the projects.

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## CONTRACT DOCUMENTS (CD)

1. The following are the contract documents:
  - a. Contract Page when signed by Canada;
  - b. Duly completed Bid and Acceptance Form and any Appendices attached thereto;
  - c. Drawings and Specifications;
  - d. General Conditions and clauses

GC1	General Provisions – Construction Services	R2810D	(2016-04-04);
GC2	Administration of the Contract-	R2820D	(2016-01-28);
GC3	Execution and Control of the Work	R2830D	(2015-02-25);
GC4	Protective Measures	R2840D	(2008-05-12);
GC5	Terms of Payment	R2850D	(2016-01-28);
GC6	Delays and Changes in the Work	R2860D	(2016-01-28);
GC7	Default, Suspension or Termination of Contract	R2870D	(2008-05-12);
GC8	Dispute Resolution	R2880D	(2016-01-28);
GC9	Contract Security	R2890D	(2014-06-26);
GC10	Insurance	R2900D	(2008-05-12);
	Allowable Costs for Contract Changes Under GC6.4.1	R2950D	(2015-02-25);
	Supplementary Conditions		
  - e. Any amendment issued or any allowable bid revision received before the date and time set for solicitation closing;
  - f. Any amendment incorporated by mutual agreement between Canada and the Contractor before acceptance of the bid; and
  - g. Any amendment or variation of the contract documents that is made in accordance with the General Conditions.
2. The documents identified by title, number and date above are incorporated by reference and are set out in the Standard Acquisition Clauses and Conditions (SACC) Manual, issued by Public Works and Government Services Canada (PWGSC). The SACC Manual is available on the PWGSC Web site:  
<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>
3. The language of the contract documents is the language of the Bid and Acceptance Form submitted.

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## BID AND ACCEPTANCE FORM (BA)

### BA01 IDENTIFICATION

Replacement of guyed telecommunication tower in Longue-Pointe de Mingan, QC.  
Solicitation No: EE517-170427/A  
Project No: R. 079124.001

### BA02 BUSINESS NAME AND ADDRESS OF BIDDER

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_ PBN: \_\_\_\_\_

Email: \_\_\_\_\_

Industrial Security Program Organisation Number (ISP ORG#) \_\_\_\_\_  
(when required)

### BA03 THE OFFER

The Bidder offers to Canada to perform and complete the Work for the above named project in accordance with the Bid Documents for the **TOTAL BID AMOUNT INDICATED IN APPENDIX 1**.

### BA04 BID VALIDITY PERIOD

The bid shall not be withdrawn for a period of sixty 60 days following the date of solicitation closing.

### BA05 ACCEPTANCE AND CONTRACT

Upon acceptance of the Contractor's offer by Canada, a binding Contract shall be formed between Canada and the Contractor. The documents forming the Contract shall be the contract documents identified in Contract Documents (CD).

### BA06 CONSTRUCTION TIME

The Contractor shall perform and complete the Work on October 27 2018 at the latest.

### BA07 BID SECURITY

The Bidder is enclosing bid security with its bid in accordance with GI08 - Bid Security Requirements of R2710T - General Instructions - Construction Services - Bid Security Requirements.

Solicitation No – N° de l'invitation  
EE517-170239/A  
Client Ref No. – N° de réf. du client  
EE517-17-0239

Amd. No. – N° de la modif.  
File No. – N° du dossier  
QCM-6-39040

Buyer ID – id de l'acheteur  
qcm008

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**BA08 SIGNATURE**

Name and title of person authorized to sign on behalf of Bidder (Type or print)

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Signature

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Date

## APPENDIX 1 - COMBINED PRICE FORM

### **NOTICE**

**TENDER DOCUMENTS:** SINCE JUNE 1ST 2013, MERX IS NO LONGER OUR SERVICE PROVIDER. FIRMS INTENDING TO SUBMIT TENDERS ON THIS PROJECT SHOULD OBTAIN TENDER DOCUMENTS THROUGH THE FOLLOWING WEBSITE:

**<https://www.achatsetventes-buyandsell.gc.ca/>**

- 1) The prices per unit shall govern in establishing the Total Extended Amount. Any arithmetical errors in this Appendix will be corrected by Canada.
- 2) Canada may reject the bid if any of the prices submitted do not reasonably reflect the cost of performing the part of the work to which that price applies.

### **LUMP SUM**

The Lump Sum Amount designates Work to which a Lump Sum Arrangement applies.

- (a) Work included in the Lump Sum Amount represents all work not included in the unit price table.

Item	Description	Firm Total Amount (\$)
1	Mobilization et demobilization	\$
2	Site Organisation	\$
3	Supply of the new tower and transportation to the site	\$
4	Foundations	\$
5	New tower installation and related works	\$
6	Dismantling of the existing tower and finishing of the installation	
<b>TOTAL LUMP SUM AMOUNT (LSA)</b> Excluding applicable GST and QST		\$

<b>TOTAL BID AMOUNT (LSA)</b> Excluding applicable GST and QST		\$
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## APPENDIX 2 – DEPARTMENTAL REPRESENTATIVE'S AUTHORITY

*TO BE PROVIDED AT CONTRACT AWARD.*

Contracting Authority is:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Department: \_\_\_\_\_

Division: \_\_\_\_\_

Telephone: \_\_\_\_ - \_\_\_\_ - \_\_\_\_\_

e-mail: \_\_\_\_\_

Technical Authority is:

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Department: \_\_\_\_\_

Division: \_\_\_\_\_

Telephone: \_\_\_\_ - \_\_\_\_ - \_\_\_\_\_

e-mail: \_\_\_\_\_



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## APPENDIX 4 - VOLUNTARY CERTIFICATION TO SUPPORT THE USE OF APPRENTICES

*Note; The contractor will be asked to fill out a report every six months or at project completion as per sample "Voluntary Reports for Apprentices Employed during the Contract" provided at Appendix 6.*

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Company Name: \_\_\_\_\_

Company Legal Name: \_\_\_\_\_

Solicitation Number: \_\_\_\_\_

Number of company employees: \_\_\_\_\_

Number of apprentices planned to be working on this contract: \_\_\_\_\_

Trades of those apprentices:

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**APPENDIX 5 - CERTIFICATE OF INSURANCE** (Not required at solicitation closing)

**CERTIFICATE OF INSURANCE**



Travaux publics et  
 Services gouvernementaux  
 Canada

Public Works and  
 Government Services  
 Canada

Description and Location of Work	Contract No.
	Project No.

Name of Insurer, Broker or Agent	Address (No., Street)	City	Province	Postal Code
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Name of Insured (Contractor)	Address (No., Street)	City	Province	Postal Code
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Additional Insured  
**Her Majesty the Queen in Right of Canada as represented by the Minister of Public Works and Government Services**

Type of Insurance	Insurer Name and Policy Number	Inception Date D / M / Y	Expiry Date D / M / Y	Limits of Liability		
				Per Occurrence	Annual General Aggregate	Completed Operations Aggregate
<b>Commercial General Liability Umbrella/Excess Liability</b>				\$	\$	\$
				\$	\$	\$
<b>Builder’s Risk / Installation Floater</b>				\$		

I certify that the above policies were issued by insurers in the course of their Insurance business in Canada, are currently in force and include the applicable insurance coverage’s stated on page 2 of this Certificate of Insurance, including advance notice of cancellation / reduction in coverage.

<input type="text"/>	<input type="text"/>
Name of person authorized to sign on behalf of Insurer(s) (Officer, Agent, Broker)	Telephone number
<input type="text"/>	<input type="text"/>
Signature	Date D / M / Y

## General

The insurance policies required on page 1 of the Certificate of Insurance must be in force and must include the insurance coverage listed under the corresponding type of insurance on this page.

The policies must insure the Contractor and must include Her Majesty the Queen in Right of Canada as represented by the Minister of Public Works and Government Services as an additional Insured.

The insurance policies must be endorsed to provide Canada with not less than thirty (30) days notice in writing in advance of a cancellation of insurance or any reduction in coverage.

Without increasing the limit of liability, the policies must protect all insured parties to the full extent of coverage provided. Further, the policies must apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each.

### Commercial General Liability

The insurance coverage provided must not be substantially less than that provided by the latest edition of IBC Form 2100. The policy must either include or be endorsed to include coverage for the following exposures or hazards if the Work is subject thereto:

- (a) Blasting.
- (b) Pile driving and caisson work.
- (c) Underpinning.
- (d) Removal or weakening of support of any structure or land whether such support be natural or otherwise if the work is performed by the insured contractor.

The policy must have the following minimum limits:

- (a) **\$5,000,000** Each Occurrence Limit;
- (b) **\$10,000,000** General Aggregate Limit per policy year if the policy contains a General Aggregate; and
- (c) **\$5,000,000** Products/Completed Operations Aggregate Limit.

Umbrella or excess liability insurance may be used to achieve the required limits.

### Builder's Risk / Installation Floater

The insurance coverage provided must not be less than that provided by the latest edition of IBC Forms 4042 and 4047.

The policy must permit use and occupancy of any of the projects, or any part thereof, where such use and occupancy is for the purposes for which a project is intended upon completion.

The policy may exclude or be endorsed to exclude coverage for loss or damage caused by asbestos, fungi or spores, cyber and terrorism.

The policy must have a limit that is **not less than the sum of the contract value** plus the declared value (if any) set forth in the contract documents of all material and equipment supplied by Canada at the site of the project to be incorporated into and form part of the finished Work. If the value of the Work is changed, the policy must be changed to reflect the revised contract value.

The policy must provide that the proceeds thereof are payable to Canada or as Canada may direct in accordance with GC10.2, "Insurance Proceeds" (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/R/R2900D/2>).



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## APPENDIX 7 - LISTING OF SUBCONTRACTORS

- 1) In accordance with GI07 - Listing of Subcontractors and Suppliers of R2710T- General Instructions - construction Services - Bid Security Requirements, the Bidder should provide a list of Subcontractors with his Bid.
- 2) The Bidder should submit the list of Subcontractors and for any portion of the Work valued at 20% or greater of the submitted Bid Price.

	Subcontractor	Division	Estimated value of work
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

**APPENDIX 8 - LISTING OF GUYED TOWER PROJECTS**

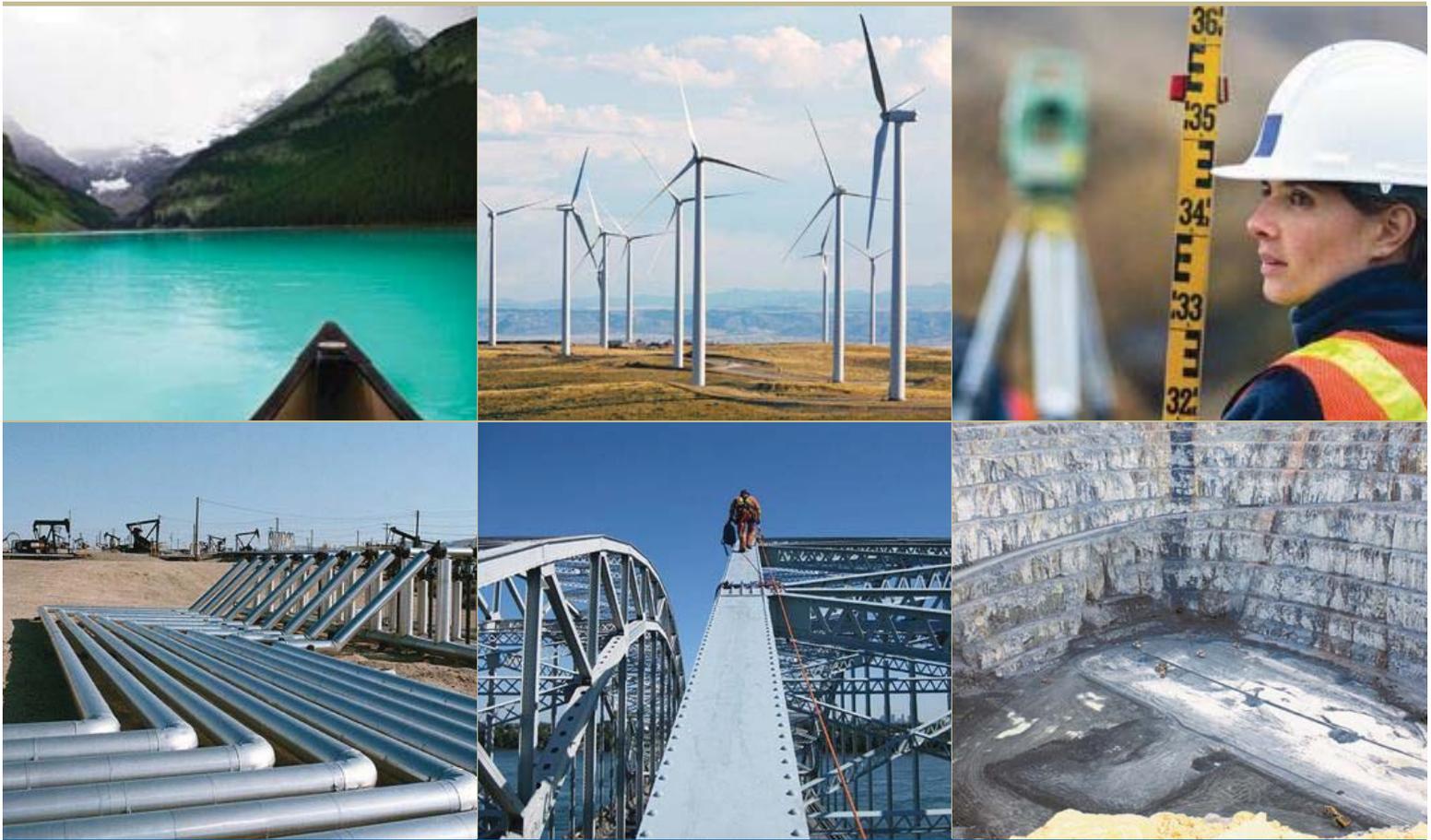
Project title	Project description	Completion date	Fabrication	Supervision of field erection	Type of tower
Project # 1			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Project # 2			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Project # 3			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Project # 4			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Project # 5			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Project # 6			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Project # 7			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Project # 8			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Project # 9			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Project # 10			Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	



Original

# Replacement of a Telecommunication Tower in Longue-Pointe de Mingan

## Specification



2016-06-21



# Replacement of a Telecommunication Tower in Longue-Pointe de Mingan

## Specification

V/Ref. : R.079124.001

N/Ref. : 29501TTA

June 21, 2016

### PRESENTED TO

#### Public Works and government Services Canada

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2016-06-21

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**END OF SECTION**

**Part 1            General**

**1.1                MEASUREMENT METHOD**

- .1     The Contractor shall, within ten (10) days after receiving an acceptance notice for the contract, provide cost breakdown for global units items.
- .2     The Contractor shall provide, within ten (10) days after receiving an acceptance notice for the contract, a list of equipment and the hourly rates for each of the equipment available for the works.
- .3     The Contractor shall, within ten (10) days after receiving an acceptance notice for the contract, provide a list of hourly rates for his staff.
- .4     The lump sum price and unit prices will include, but not limited to, leasing, equipment installation, equipment, tools, labour, administrative costs, profit, funding, expenditure for work not specifically defined either in the plan, or specifications or any other tender documents, but considered necessary so as to conform to best practices.
- .5     All work described in this specifications, or presented in the plans, or necessary for the completion of all the work specified herein, but not defined as a separate item requiring a fixed rate or unit payment, will be considered as directly or indirectly linked to the overall purpose of the contract and no separate payment will be made for any of these works; the cost of any work that is directly or indirectly linked to the aim of this contract must however be included in the unit prices quoted in the tender.
- .6     The method used to measure labour, tools or materials for the contract will be as follows:
  - .1     Lump sum works: such jobs will be appraised as a global unit. They include, but are not limited to:
    - .1     **Item 1 - Mobilization and demobilization**
      - .1     This item will be measured as a global unit and will include all costs related to the transportation and handling of all equipment and construction of facilities.
      - .2     This item will be paid following a 50% proportion at the beginning of the contract and 50% after premises have been returned to pre-work state and the final cleaning. If some equipment are to be demobilized before the end of the contract, a justified payment may be done upon approval from the Departmental Representative.
    - .2     **Item 2 - Site organization**
      - .1     This item will be measured as a global unit and will include, but not be limited to, the following:
        - .1     Surety and administrative charges;
        - .2     Investigation, planning, management and supervision;
        - .3     Permits and request for authorization (municipal, provincial and federal);

- .4 Management of general waste that is not included in other items;
  - .5 Connection and disconnection of temporary services (electricity, water, etc.);
  - .6 Bills for temporary public services (electricity, telephone, Internet, water, etc.);
  - .7 Supply and construction of temporary fences around construction sites and dismantling them around the different areas (construction site, assembly, storage, etc.);
  - .8 Temporary installations at construction sites;
  - .9 Tidiness at the construction site and final cleaning;
  - .10 Security services, signallers, guards, etc.;
  - .11 All components under section 01 of the specifications. It also includes works indicated in the plans and specifications for which payment was not designated in another measured item.
- .2 This item will be paid in proportion of completed work, following bid form costs. The value of this item shall, at no time, go beyond 5% of the total cost for the bid.
- .3 **Item 3 – Supply of the new tower and transport to the site**
- .1 This item will be measured as a global unit and will include, but not be limited to, the following:
    - .1 Design, fabrication, transport and delivery of the new tower;
    - .2 Design, fabrication, transport and delivery of two cable trays and their supporting structure;
    - .3 Design, fabrication, transport and delivery of the antenna supports;
    - .4 Design and supply of a day and night lighting system;
- .4 **Item 4 – Foundations**
- .1 This item will be paid following a global unit and will include the design, fabrication and installation of reinforced concrete foundations in the works following the limits specified in the plan.
  - .2 The tendered price will include the cost for all labour, machinery, transportation and materials needed for reinforced concrete foundations. Materials include, among other thing, but are not limited to, concrete, rebar, formwork and anchor bolts.
  - .3 This item should also include the installation of all steelworks, anchor be embedded in concrete, galvanizing of items where required, pouring, concrete curing and finishing and waterproofing surfaces, as well as any other work not specifically described, but required to carry out such work in accordance with the plans and specifications.

- .4 This item must also include all direct and indirect costs linked to works protection and temporary heating during the pouring of concrete in cold weather.
  - .5 The heating of water and granular materials, as well as the measures taken to protect concrete in cold weather will not be measured, but considered an integral part of the project.
  - .6 Concrete cooling and hot weather protection will not be measured, but considered an integral part of the project.
  - .7 Excavation and backfilling of the foundation as well as the rehabilitation of the work site are included in this item.
- .5 **Item 5 – New tower installation and related works**
- .1 This item will be measured as a global unit and will include, but not be limited to, the following:
    - .1 The installation of the tower and the guys;
    - .2 The installation of the cable trays and its supports;
    - .3 The installation of the antenna supports;
    - .4 The installation of the day and night lighting system, including the connexion to the existing electrical panel;
    - .5 The surveillance of the installation of the tower;
- .6 **Item 6 – Dismantling of the existing tower and finishing of the installation**
- .1 This item will be measured as a global unit and will include, but not be limited to, the following:
    - .1 The dismantling of the existing tower, its guys and its cable trays;
    - .2 The disposal and/or recycling of demolition products;
    - .3 The partial demolition of the existing tower's foundations and the existing cable tray support's foundations.

**1 GENERAL**

**1.01 RELATED REQUIREMENTS**

- .1 Section 13 30 10 – Guyed steel communication tower.

**1.02 REFERENCES**

- .1 Not Used.

**1.03 ADMINISTRATIVE**

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence as to not cause delay in Work. Failure to submit in ample time 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 coordinated 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 Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.

**1.04 SHOP DRAWINGS AND PRODUCT DATA**

- .1 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.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Quebec.

- .3 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 coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 7 days for Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 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.
- .8 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, verification of field measurements and compliance with Contract Documents.
  - .5 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field 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.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit one (1) electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

- .11 Submit one (1) 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.
- .12 Submit one (1) electronic copy 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.
- .13 Submit one (1) electronic copy 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.
- .14 Submit one (1) electronic copy 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.
- .15 Submit one (1) electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit one (1) electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .18 Delete information not applicable to project.
- .19 Supply standard information to provide details applicable to project.
- .20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, shop drawings will be returned and fabrication and installation 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 and installation of Work may proceed.
- .21 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining compliance with general concept.
  - .1 This review shall not mean that PWGSC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
  - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication

processes or to techniques of construction and installation and for coordination of Work of sub-trades.

**1.05 SAMPLES**

- .1 Submit for review two (2) samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's business address.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where color, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

**1.06 PHOTOGRAPHIC DOCUMENTATION**

- .1 Submit electronic and hard copy of color digital photography in .jpg format, fine resolution as directed by Departmental Representative.
- .2 Project identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints: 2 locations.
  - .1 Viewpoints and their location as determined by Departmental Representative.
- .4 Frequency of photographic documentation: as directed by Departmental Representative.
  - .1 Upon completion of framing and before concealment of Work, as directed by Departmental Representative.

**1.07 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.

**2 PRODUCTS**

**2.01 NOT USED**

- .1 Not Used.

**REPLACEMENT OF A TELECOMMUNICATION TOWER  
IN LONGUE-POINTE DE MINGAN**

**SECTION 01 33 00  
SUBMITTAL PROCEDURES  
PAGE 5**

**3 EXECUTION**

**3.01 NOT USED**

.1 Not Used.

**END OF SECTION**

**1 GENERAL**

**1.01 RELATED REQUIREMENTS**

- .1 Not used.

**1.02 REFERENCES**

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .3 Province of Quebec
  - .1 An Act Respecting Occupational Health and Safety, R.S.Q. (updated 2015).

**1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 21 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
  - .1 Results of site-specific safety hazard assessment.
  - .2 Results of safety and health risk or hazard analysis for site tasks and operation.
- .3 Submit one (1) copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

**1.04 FILING OF NOTICE**

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location and not the entire complex. Contractor shall provide a written acknowledgement of this responsibility with 3 weeks of contract award. Contractor to submit written acknowledgement to CNESST along with Ouverture de Chantier Notice.
- .3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

**1.05 SAFETY ASSESSMENT**

- .1 Perform site specific safety hazard assessment related to project.

**1.06 MEETINGS**

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

**1.07 GENERAL REQUIREMENTS**

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

**1.08 RESPONSIBILITY**

- .1 Be responsible for health and safety of persons on site, safety of property on site during the construction phases and the antenna transfer period by the owner and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 As part of the construction works, the contractor shall be the prime contractor as described in the Occupational Health and Safety Act of Quebec, to perform only the works forming part of its scope and areas defined and described in this document.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .4 The health and safety subordination agreement in annex 1 will be signed by the employees of the owner of its subcontractor and the prime contractor for the activities related to the antenna transfer.

**1.09 COMPLIANCE REQUIREMENTS**

- .1 Comply with Occupational Health and Safety Act, Industrial and Commercial Establishments

Regulation, R.R.Q.

**1.10 UNFORSEEN HAZARDS**

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.

**1.11 HEALTH AND SAFETY COORDINATOR**

- .1 Assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
  - .1 Have site-related working experience specific to activities associated with the installation of a guyed tower.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
  - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .5 Be on site during execution of Work and during the antenna transfer period.

**1.12 POSTING OF DOCUMENTS**

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

**1.13 CORRECTION OF NON-COMPLIANCE**

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

**1.14 BLASTING**

- .1 Blasting or other use of explosives is not permitted.

**1.15 POWDER ACTUATED DEVICES**

- .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

**1.16 WORK STOPPAGE**

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

**2 PRODUCTS**

**2.01 NOT USED**

- .1 Not used.

**3 EXECUTION**

**3.01 NOT USED**

- .1 Not used.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Not Used.

**1.2                REFERENCES**

- .1            Definitions:
  - .1            Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
  - .2            Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.
- .2            Reference Standards:
  - .1            U.S. Environmental Protection Agency (EPA)/Office of Water
    - .1            EPA 832/R-92-005, Storm Water Management for Construction Activities, Chapter 3.

**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 and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2            Submit 1 copy of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements, 01 35 43 - Environmental Procedures.
- .3            Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.
- .4            Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .5            Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .6            Include in Environmental Protection Plan:
  - .1            Names of persons responsible for ensuring adherence to Environmental Protection Plan.
  - .2            Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
  - .3            Names and qualifications of persons responsible for training site personnel.
  - .4            Descriptions of environmental protection personnel training program.

- .5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations and EPA 832/R-92-005, Chapter 3.
- .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
  - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
- .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
  - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .13 Waste Water Management Plan identifying methods and procedures for management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- .15 Pesticide treatment plan to be included and updated, as required.

**1.4 FIRES**

- .1 Fires and burning of rubbish on site is not permitted.

**1.5 DRAINAGE**

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and

sediment control plan, Federal, Provincial, and Municipal laws and regulations, EPA 832/R-92-005, Chapter 3, US EPA General Construction Permit.

- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

**1.6 SITE CLEARING AND PLANT PROTECTION**

- .1 Protect trees and plants on site and adjacent properties as indicated.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
  - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 Restrict tree removal to areas designated by Departmental Representative.

**1.7 WORK ADJACENT TO WATERWAYS**

- .1 Construction equipment to be operated on land only.
- .2 Waterways to be kept free of excavated fill, waste material and debris.
- .3 Design and construct temporary crossings to minimize erosion to waterways.
- .4 Do not skid logs or construction materials across waterways.
- .5 Blasting is not allowed.

**1.8 MITIGATION MESURES**

- .1 No work shall be done during the nesting period for migratory birds between mid-May and the end of July.
- .2 Inform all workers on site regarding the potential presence wildlife of species with special status and provide a procedure to follow if one of them is sighted on the work site.
- .3 Define the work and traffic areas and limit the movement of the machinery inside these areas.
- .4 Use equipment and vehicles in good working condition according to current regulations.
- .5 Optimize the movement of machinery.
- .6 Turn off the engine of the machinery when idle.

- .7 Regularly inspect and maintain vehicles and their exhaust systems. Provide documentation.
- .8 Store petroleum products and refuel vehicles and machinery in a place intended for this purpose and located at a distance of at least 30 m from any watercourse or body of water.
- .9 Cover soil and materials during their transport.
- .10 Disturb compacted soils in traffic areas and construction sites after the work to avoid rutting and to eliminate water runoff.
- .11 Repair areas of work at the end of the worksite and proceed with native plant seeding.
- .12 Use a flashing type lighting on the new Tower and the guy wires, if they are thin and inconspicuous, in order to reduce the risk of incidental take of migratory birds.
- .13 Quickly remove any debris accidentally released.
- .14 Ensure the safety of workers and the public by using protective barriers and adequate signs around the work site.

**1.9 PREVENTION OF ACCIDENTS AND FAILURES**

- .1 Hold a meeting with the workers before the start of the work, to inform them of the environmental and security contractual requirements, including the components of the emergency plan.
- .2 Hazardous materials must be managed in accordance with the hazardous materials regulations (R.S.Q., c. Q-2, r. 15.2);
- .3 Maintain vehicles and equipment in perfect working condition and check daily for contaminant leakage;
- .4 Do not handle nor store hydrocarbons and hazardous products within 30 m of water;
- .5 Petroleum storage systems must conform to federal regulations and/or to provincial government regulations if applicable;
- .6 Perform, under constant surveillance, all manipulations of fuel, oil and other hazardous products in order to avoid accidental spills.
- .7 Provide recovery kits (flanges and oleophilic absorbent materials, polyethylene, waterproof bags, waterproof containers, shovels, gloves, leaking valves, etc.) on site for petroleum and waste and spill absorbent materials;
- .8 Implement an emergency plan and ensure its immediate application before the commencement of the work;
- .9 In the event of a spill, contact Departmental Representative and contact the following organizations without delay:
  - Emergency-Environnement Québec: 1-866 694-5454;
  - Emergency Environment Canada: 1-866-283-2333.

**1.10 POLLUTION CONTROL**

- .1 Maintain temporary erosion and pollution control features installed under this Contract.

- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

**1.11 HISTORICAL/ARCHAEOLOGICAL CONTROL**

- .1 Provide historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.
- .2 Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.

**1.12 NOTIFICATION**

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
  - .1 Take action only after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Bury rubbish and waste materials on site where directed after receipt of written approval from Departmental Representative.
- .3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .5 Waste Management: separate waste materials for recycling in accordance with Section.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**

**1 GENERAL**

**1.01 RELATED REQUIREMENTS**

- .1 Not Used.

**1.02 REFERENCES**

- .1 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions "C", In Effect as Of: May 14, 2004.

**1.03 PROJECT CLEANLINESS**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling.
- .7 Dispose of waste materials and debris off site.
- .8 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

**1.04 FINAL CLEANING**

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and

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- suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
  - .4 Remove waste products and debris including that caused by Owner or other Contractors.
  - .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
  - .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
  - .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
  - .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls and floors.
  - .9 Clean lighting reflectors, lenses, and other lighting surfaces.
  - .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
  - .11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
  - .12 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
  - .13 Remove dirt and other disfiguration from exterior surfaces.
  - .14 Clean and sweep roofs, gutters, areaways, and sunken wells.
  - .15 Sweep and wash clean paved areas.
  - .16 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
  - .17 Clean roofs, downspouts, and drainage systems.
  - .18 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
  - .19 Remove snow and ice from access to building.
  - .20 Site restoration must be completed as quickly as possible after the work.

**1.05 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for recycling.

**REPLACEMENT OF A TELECOMMUNICATION TOWER  
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**2 PRODUCTS**

**2.01 NOT USED**

.1 Not Used.

**3 EXECUTION**

**3.01 NOT USED**

.1 Not Used.

**END OF SECTION**

**1 GENERAL**

**1.01 RELATED REQUIREMENTS**

- .1 Not Used

**1.02 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA-O86S1-14, Engineering Design in Wood.
  - .3 CSA O121-(R2003), Douglas Fir Plywood.
  - .4 CSA O151-09, Canadian Softwood Plywood.
  - .5 CSA O153-13, Poplar Plywood.
  - .6 CAN/CSA-O325.07(R2012)], Construction Sheathing.
  - .7 CSA O437 Series-93(R2011), Standards for OSB and Waferboard.
  - .8 CSA S269.1-16, Falsework for Construction Purposes.
- .2 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

**1.03 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings for formwork and falsework.
- .3 Submit WHMIS MSDS - Material Safety Data Sheets.

**1.04 DELIVERY, STORAGE AND HANDLING**

- .1 Waste Management and Disposal:
  - .1 Separate waste materials for recycling.
  - .2 Place materials defined as hazardous or toxic in designated containers.
  - .3 Divert wood materials from landfill to a recycling facility as approved by Departmental Representative.
  - .4 Divert plastic materials from landfill to a recycling or reuse facility as approved by Departmental Representative.
  - .5 Divert unused form release material from landfill to an official hazardous material collections site as approved by the Departmental Representative.

**2 PRODUCTS**

**2.01 MATERIALS**

- .1 Formwork materials:
  - .1 For concrete without special architectural features, use wood and wood product formwork materials to CAN/CSA-O86.

- .2 Form ties:
  - .1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
- .3 Form release agent:[non-toxic, biodegradable, low VOC.
- .4 Form stripping agent: colourless mineral oil, non-toxic,[biodegradable, low VOC,free of kerosene, with viscosity between 70 and 110s Saybolt Universal at 40 degrees C, flashpoint minimum 150 degrees C, open cup.
- .5 Falsework materials: to CSA-S269.1.

### **3 EXECUTION**

#### **3.01 FABRICATION AND ERECTION**

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Fabricate and erect falsework in accordance with CSA S269.1.
- .5 Do not place shores and mud sills on frozen ground.
- .6 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
- .8 Align form joints and make watertight.
  - .1 Keep form joints to minimum.
- .9 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .10 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .11 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
  - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .12 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

#### **3.02 REMOVAL AND RESHORING**

- .1 Leave formwork in place for following minimum periods of time after placing concrete.

- .1 3 days for footings and abutments.
- .2 Remove formwork when concrete has reached 75 % of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

**END OF SECTION**

**1 GENERAL**

**1.01 RELATED REQUIREMENTS**

- .1 Not Used.

**1.02 PRICE AND PAYMENT PROCEDURES**

- .1 Measurement and Payment:
  - .1 No measurement will be made under this Section.
    - .1 Include reinforcement costs in items of concrete work in Section 03 30 00.01 - Cast-In-Place Concrete.

**1.03 REFERENCES**

- .1 ASTM International
  - .1 ASTM A 1064/A 1064M-16, Standard Specification for Carbon-Steel Wire and Welded wire Reinforcement, Plain and deformed, for Concrete.
  - .2 ASTM A 143/A 143M-07(2014), Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
- .2 CSA International
  - .1 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CAN/CSA-A23.3-14, Design of Concrete Structures.
  - .3 CSA-G30.18-09 (R2014), Carbon Steel Bars for Concrete Reinforcement.
  - .4 CSA-G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .5 CSA W186-M1990(R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .3 Reinforcing Steel Institute of Canada (RSIC)
  - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

**1.04 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.
- .3 Shop Drawings:
  - .1 Indicate placing of reinforcement and:
    - .1 Bar bending details.
    - .2 Lists.
    - .3 Quantities of reinforcement.
    - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
    - .5 Indicate sizes, spacings and locations of chairs, spacers and hangers.

- .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3.
  - .1 Provide type B tension lap splices unless otherwise indicated.

### **1.05 QUALITY ASSURANCE**

- .1 Submit in accordance with Section [01 45 00 - Quality Control] and as described in PART 2 - SOURCE QUALITY CONTROL.
  - .1 Mill Test Report: provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.
  - .2 Submit in writing to Departmental Representative proposed source of reinforcement material to be supplied.

### **1.06 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance 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 off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **2 PRODUCTS**

### **2.01 MATERIALS**

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400W, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.
- .4 Cold-drawn annealed steel wire ties: to ASTM A 1064/A 1064M.
- .5 Deformed steel wire for concrete reinforcement: to ASTM A 1064/A 1064M.
- .6 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .7 Mechanical splices: subject to approval of Departmental Representative.
- .8 Plain round bars: to CSA-G40.20/G40.21.

### **2.02 FABRICATION**

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and [Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.

- .3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

**2.03 SOURCE QUALITY CONTROL**

- .1 Provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
- .2 Upon request inform Departmental Representative of proposed source of material to be supplied.

**3 EXECUTION**

**3.01 FIELD BENDING**

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.
- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

**3.02 PLACING REINFORCEMENT**

- .1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.
- .2 Use plain round bars as slip dowels in concrete.
  - .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.
  - .2 When paint is dry, apply thick even film of mineral lubricating grease.
- .3 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .4 Ensure cover to reinforcement is maintained during concrete pour.
- .5 Minimum concrete cover of reinforcement is 75mm.

**3.03 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling.

**END OF SECTION**

**1 GENERAL**

**1.01 RELATED REQUIREMENTS**

- .1 Not Used.

**1.02 REFERENCES**

- .1 ASTM International
  - .1 ASTM A 1064/A 1064M-16, Standard Specification for Carbon-Steel Wire and Welded wire Reinforcement, Plain and deformed, for Concrete.
  - .2 ASTM D 1751-04(2013)e1, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non extruding and Resilient Bituminous Types).
- .2 CSA International
  - .1 CSA-A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
  - .3 CAN/CSA-G30.18-09(R2014)], Billet-Steel Bars for Concrete Reinforcement.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-installation Meetings: convene pre-installation meeting one week prior to beginning concrete works.
  - .1 Ensure key personnel attends.
  - .2 Verify project requirements.

**1.04 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and necessary details of reinforcing.
  - .2 Submit drawings showing formwork and falsework design to: CSA A23.1/A23.2.
  - .3 Submit drawings stamped and signed by professional engineer registered or licensed in the province of Québec, Canada.
- .3 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

**1.05 QUALITY ASSURANCE**

- .1 Provide to Departmental Representative, 4 weeks minimum prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

**1.06 DELIVERY, STORAGE AND HANDLING**

- .1 Delivery and Acceptance Requirements:
  - .1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.
    - .1 Do not modify maximum time limit without receipt of prior written agreement from Departmental and concrete producer as described in CSA A23.1/A23.2.
    - .2 Deviations to be submitted for review by the [Departmental Representative.
  - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

**2 PRODUCTS**

**2.01 DESIGN CRITERIA**

- .1 According to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

**2.02 PERFORMANCE CRITERIA**

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

**2.03 MATERIALS**

- .1 Cement: to CSA A3001, Type GU.
- .2 Water: to CSA A23.1/A23.2.
- .3 Reinforcing bars: to CAN/CSA-G30.18, Grade 400W.
- .4 Premoulded joint filler:
  - .1 Bituminous impregnated fibreboard: to ASTM D 1751.
- .5 Other concrete materials: to CSA A23.1/A23.2.

**2.04 MIXES**

- .1 Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.
  - .1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as described in PART 3 - VERIFICATION.
  - .2 Provide concrete mix to meet following plastic state requirements:
    - .1 Uniformity: to A23.1.
    - .2 Workability: free of segregation.
    - .3 Concrete slump: 80mm ± 20mm.
  - .3 Provide concrete mix to meet following hard state requirements:
    - .1 Durability and class of exposure: F-1.
    - .2 Compressive strength at 28 age: 30 MPa minimum.
    - .3 Intended application: Foundations.
    - .4 Aggregate size 20 mm maximum.
  - .4 Concrete supplier's certification.

- .5 Provide quality management plan to ensure verification of concrete quality to specified performance.
- .6 Provide certification conforming with A23.2 to attest that aggregates are used are not subject to alkali-aggregate reactions.

### **3 EXECUTION**

#### **3.01 PREPARATION**

- .1 Provide Departmental Representative 72 hours notice before each concrete pour.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 During concreting operations:
  - .1 Development of cold joints is not allowed.
  - .2 Ensure concrete delivery and handling facilitates placing with minimum of rehandling, and without damage to existing structure or Work.
- .4 Protect previous Work from staining.
- .5 Clean and remove stains prior to application of concrete finishes.

#### **3.02 INSTALLATION/APPLICATION**

- .1 Do cast-in-place concrete work in accordance with CSA A23.1/A23.2.
- .2 Sleeves and inserts:
  - .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in.
  - .2 Sleeves and openings greater than 100 mm x 100 mm not indicated, must be reviewed by Departmental Representative.

#### **3.03 FINISHES**

- .1 Formed surfaces exposed to view: in accordance with CSA A23.1/A23.2.

#### **3.04 CURING**

- .1 Use curing compounds compatible with applied finish on concrete surfaces free of bonding agents and to CSA A23.1/A23.2.

#### **3.05 FIELD QUALITY CONTROL**

- .1 Concrete testing: to CSA A23.1/A23.2 by testing laboratory designated and paid for by Departmental Representative.

#### **3.06 CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Use trigger operated spray nozzles for water hoses.
- .3 Designate cleaning area for tools to limit water use and runoff.

- .4 Cleaning of concrete equipment to be done in accordance with Section 01 35 43 Environmental Procedures.
  
- .5 Waste Management: separate waste materials for recycling.
  - .1 Divert unused concrete materials from landfill to approved local official hazardous material collections site after receipt of written approval from Departmental Representative.
  - .2 Provide appropriate area on job site where concrete trucks can be safely washed.
  - .3 Divert admixtures and additive materials from landfill to approved local official hazardous material collections site after receipt of written approval from Departmental Representative.
  - .4 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

**END OF SECTION**

## 1 GENERAL

### 1.01 SCOPE OF WORK

- .1 Design, fabrication and erection of one (1) guyed galvanized steel telecommunication tower, located in Longue-Pointe de Mingan in the province of Quebec (50°16'24'' north latitude and 64°07'53'' west longitude), including the design, fabrication and erection of the following and all other items included in the plans and specifications:
  1. Two (2) ±5.5m long cable trays for the protection of the coaxial cables between the tower and the two existing telecommunication buildings.
  2. The structure supporting the cable trays.
  3. The antenna supports.
  4. Day and night lighting system, including the connexion to the existing electrical panel in the building.
  5. The anchors for the tower, guys and the structural support of the cable trays.
  6. The foundations for the new telecommunication tower, guys and the structural support of the cable trays
- .2 The delivery, unloading, storing on site of all materials, the tower, guys, cable trays and accessories, antenna support, ect. Delivery dates to be coordinated with Departmental Representative.
- .3 Demolition and disposal of the old telecommunication tower and the old cable tray.
- .4 Work on site must be done between August 8<sup>th</sup> and October 28<sup>th</sup> 2016..
- .5 Work on site must be coordinated with the Departmental Representative according to the following:
  1. Allow 28 days for concrete curing before the installation of the new tower.
  2. The installation of the tower will be done in two phases:  
Phase 1: Erection of the new tower with temporary guys (if required) to replace new guys that might be in conflict with existing guys.  
Phase 2: Dismantling of the existing tower and final installation of the new tower guys.  
Allow 3 weeks maximum between phase 1 and phase 2 for the antennas transfer by the owners. During this period, the scheduled term for the transfer of antennas by the owner is 1 week to be coordinated with the Department's Representative.
- .6 Protect all existing systems during work to ensure proper functioning of all the existing communication antennas.
- .7 Application for the necessary permits from the competent authorities, municipal, provincial and federal.

**1.02 RELATED REQUIREMENTS**

- .1 Not used.

**1.03 REFERENCES**

- .1 Canadian Standard Association (CSA)
  - .1 CSA S37-13 “Antennas, Towers and Antenna-Supporting Structures”.
  - .2 CSA S16-14 “Design of Steel Structures”
  - .3 CSA C22.1 No 126.1-09 (R2014) “Metal cable tray systems”
  - .4 CSA G40.20-13/G40.21-13 “General Requirements for rolled or welded structural quality steel / Structural quality steel”
  - .5 CSA W47.1-09 (2014) “Certification of companies for fusion welding of steel”
  - .6 CSA W48-14 “Filler metals and allied materials for metal arc welding”
  - .7 CSA W59-13 “Welded steel construction (metal arc welding)”
- .2 Transport Canada
  - .1 Canadian Aviation regulations (CARs), Standard 621, 2<sup>nd</sup> Edition.
- .3 ASTM International
  - .1 ASTM A 325-14, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
  - .2 ASTM A 325M-14, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric).
  - .3 ASTM A 490-14a, Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
  - .4 ASTM A 490M-14a, Standard Specification for High-Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric).
  - .5 ASTM A 123 / A 123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .6 ASTM F2329 / F2329M-15, Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

**1.04 WORK NOT INCLUDED**

- .1 The antennas and the transfer of existing antennas.

**1.05 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with chapter 4 and section 01 33 00.
- .2 Submit a schedule for the fabrication and supply within 7 days of the contract closing.
- .3 Submit the complete tower design and structural support of the cable trays design with the final location of the anchors and foundations (for the tower, guys and support of the cable trays) within 20 business days of the receipt of the offer’s acceptance notice.
- .4 Submit all the necessary installation instructions within 30 business days of the receipt of the offer’s acceptance notice.

**2 DESIGN SPECIFICATIONS**

**2.01 DESIGN CODE**

- .1 Use tower design standard: CSA standard S37-13 "Antennas, Towers and Antenna-Supporting Structures" and standard CSA S16-14 "Design of steel structures" for the design of the tower and the antenna supports. In the event there is a conflicting statement between the CSA standard and the specifications outlined in this document, the more conservative specification shall be followed.
- .2 According to the classification of works of the National Building Code of Canada, the telecommunication towers and all its appurtenances shall be classified as WORK FOR CIVIL PROTECTION as an Essential Facilities and shall meet or exceed the requirements.

**2.02 DESIGN LOAD**

**.1 WIND**

- .1 The reference wind pressure, based on the site wind pressure, shall be applied on the entire structure and all elements fixed on it, antennas included.
- .2 The gust response ( $C_g$ ) shall be 2.0 according to NBC and CSA S37-13 Standard.
- .3 Combined telecommunication tower wind loads and antenna loads shall be applied in combination such that the maximum axial forces are produced in girders, diagonals, and legs. Multiple analyses for different wind directions and load combinations will be necessary to ensure that worst case design conditions have been investigated.
- .4 The tower design shall consider a minimum of nine (9) wind directions: (3) face winds, (3) apex winds and (3) parallel winds. When excessive shear forces and moments occur on tower locations other than joints, an additional second order analysis may be required. (Excessive forces and moments would be caused by conditions such as all microwave antennas loaded on one face of the tower, or several microwave antennas concentrated in one compact location of the tower mounted at non-joint locations).

**.2 ICE**

- .1 The design ice thickness shall be 40 mm of solid radial ice with a density of 9 kN/m<sup>3</sup> applied to all parts of the tower, platforms, antennas, guys and accessories.
- .2 The reference pressure shall be applied on the tower as required by S37-13 for the combination of ice and wind loads.

**.3 TEMPERATURE GAP**

- .1 The effect of temperature variation shall be taken in to account assuming that the site maximum temperature is 40°C and the minimum is -50°C; the temperature assumed at the moment of erection shall be noted in the submittal documents.

**.4 ANTENNAS AND WAVEGUIDE LINE LOADS**

- .1 For design purposes, the loading imposed on the tower by antennas, transmission or waveguide lines shall be based on the antennas and actual dimensions of the lines as outlined below:

No.	Antenna Type	Elevation (m) <sup>1</sup>	Azimut (deg.)	Waveguide line	Owner
1	Sinclair SRL-210A-4	36,40	356	LDF4-50A	Hydro-Québec
2	Comprod	28,40	272	LDF4-50A	Hydro-Québec

	290-70				
3	Sinclair SRL-210A-4	45,10	155	LDF5-50A	Parcs Canada
4	Sinclair SRL-307 RCHD-2	22,60	95	LDF4-50A	Parcs Canada

<sup>1</sup>. The elevation is established from the underside of the base plate

The weight of the antenna supports must be taken into account in the design.

The weight of two antennas similar to the ones indicated above shall be added to the loads at a height that will produce the maximum stresses in the structural elements. These antennas are subject to the same loads as the ones in the above table.

**.5 LIVE LOADS**

- .1 The fall arrest equipment, like Anchor plates and Fall Arrest Anchors, shall be designed to support the maximum load and impact force of at least two people according to the Quebec Occupational Health and Safety Commission.
- .2 Under operational wind pressures (31 meters per second), all individual tower components, including lattice, bracing railings, antenna mounts, etc., shall be designed to support safety lanyard and temporary rigging and all horizontal members shall be capable of supporting a 1.3 kN vertical load at mid-span in addition to all other design loads

**.6 SERVICEABILITY**

- .1 The maximum tower twist and sway shall not exceed 2.3 degrees at the uppermost part of the tower section and 0.7 degrees at the uppermost antenna attachment point of the tower open lattice section. This displacement requirement shall be maintained through wind speeds up to 31 meters per second.
- .2 The telecommunication tower deflection limits shall be held both vertically and horizontally. Deflection and rotation must be determined at each specific point on the tower where an antenna is attached.

**2.03. SPECIAL DESIGN CONSIDERATIONS**

- .1 Ladder Steps or Ladders shall be an integral part of the tower.
- .2 Transmission Line Brackets shall be an integral part of the tower.
- .3 Waveguide bridge from the tower to the buildings will be designed so that it is fully supported by steel members.
- .4 A manufacturer's standard Anti-Climb device shall be utilized at the bottom of the tower.
- .5 The tower and cable grounding shall be design and provided with the tower.
- .6 The day and night lighting and cables are designed and provided with the tower. The lighting shall comply with Canadian Aviation regulations (CARs) - standard 621, 2<sup>nd</sup> Edition. The lighting includes, but is not limited to: Day and night lighting, cables, supports, accessories, etc.
- .7 The tower and cable tray system shall be designed for the most conservative of the following:
  - The tower must be able to support the weight of two additional antennas and their transmission lines.

- The tower members and guys must be designed at a maximum of 90% capacity.
- .8 The tower and guys configuration is similar to the existing tower before its demolition.
- .9 The new tower will be installed near the existing tower, before its demolition.
- .10 Submit temporary anchor points or a temporary anchorage system with temporary guys and the installation procedures, to be able to install temporary guys in replacements of guys that could be in conflict with the existing tower guys until the demolition of the latest. The tower must be fully operational with the temporary guys.

#### **2.04. CALCULATIONS AND MODELING**

- .1 A finite element analysis computer program in wide spread use by structural engineers involved in design of telecommunication towers, using a 3-dimensional (space) model, shall be used to analyze and design the towers. The contractor shall indicate in Canada, within 48 hours of a request, the software version that will be used.

The name and the version that the contractor proposes to use shall be indicated in the proposal documents.

- .2 The design of each member shall take into account the interaction of the internal forces resulting from the applied loads.
- .3 All members shall be considered as main members for the purpose of calculation of the member strength.
- .4 The effects of both horizontal and vertical eccentricities at the connection joints shall be part of the analysis and design process.
- .5 The telecommunication tower twist and sway at all antenna mounting elevations shall be determined by analytical methods and shall be noted in the structural analysis report.

#### **2.05 CABLE TRAY**

- .1 Provide all the cable trays, fittings and accessories necessary.
- .2 Cable trays, fittings and accessories must be galvanized steel according to ASTM A123 and F2329, measuring 300 mm in width and 100 mm deep. Fittings and accessories shall be designed to be used with the provided cable trays. The cable trays must have a radius of curvature of at least 300 mm.
- .3 Each section of cable trays must be grounded using a 2 AWG copper conductor, connected according to the Canadian Electrical Code requirements.
- .4 Remove sharp edges and protrusions to avoid damaging cables and injuring people.
- .5 Install the cables separately.
- .6 Put the cables in cable trays. Use rollers to pull the cables if required.
- .7 Secure the cables in the cable trays using nylon fasteners at every 3 m.

## **2.06 GROUNDING**

- .1 The tower must be connected to the existing grounding system on the site according to the Canadian Electrical Code.
- .2 A grounding cable must be installed up to the top of the tower and a lightning rod must be installed as required by the Canadian Electrical Code.
- .3 The cable trays between the tower and the buildings must be connected to the existing grounding system.
- .4 Add grounding rods close to the antennas.
- .5 The grounding cable must be grounded at the entrance of the buildings and the antenna using appropriate grounding kit for the type of cable used. If the cable is more than 30 m long, a grounding cable should be added so that there is not more than 30 m between two grounding cables.

## **2.07 REFERENCE DOCUMENTS**

- .1 A geotechnical report in French only, entitled «construction d'une tour haubanée, Longue Pointe de Mingan », May 2016, is available for consultation only at the offices of Public works and Government Services Canada, at 1550 D'estimauville in Quebec.

## **3 OPERATIONAL AND PERFORMANCE REQUIREMENTS**

### **3.01 GENERAL**

- .1 Provide one (1) guyed tower. The tower shall consist of three (3) sided lattice type structure. The horizontal dimension of each face of the tower shall be equal. The height of the tower shall be at least 50 meters but not more than 60 meters.
- .2 It must be shown in the design calculations that the proposed tower is the lightest possible.
- .3 All the tolerances specified in CSA S37-13 shall be respected. Tolerances related to guy tensions, tower twist, tower verticality, member straightness, etc.
- .4 All the steel for the tower, guys, cable trays, antenna support, anchors, bolts, etc. are galvanized according to ASTM A123 and F2329.

### **3.02 FIXED LADDER**

- .1 The fixed ladders shall conform to CSA S37-13 Standard and this specification. Provide a continuous fixed ladder equipped with fall-arresting devices in accordance with the following paragraphs:
  - .1 Ladder shall extend continuously from the tower base to the top of the tower.
  - .2 The maximum allowable spacing of the horizontal step rungs will be 300 mm. The minimum diameter of the step rungs will be 19 mm and will support a concentrated load of 1.4 kN. The minimum allowable spacing of the side rails shall be 400 mm.

- .3 Equip ladder with a 10 mm diameter galvanized steel safety cable approved as safety line by OHS legislation. Equip with top, bottom and intermediate brackets in accordance with the manufacturer's recommendations.
- .4 Equip the bottom 10 feet of the ladder with a padlockable clam-shell type anti-climbing shield.

### **3.03 FALL ARREST**

- .1 Sliders and ladders in accordance to OHS legislation shall be installed. The installation shall be according to manufacturer's specifications.
- .2 Top anchor points must be designed prior to the fabrication of the tower.

### **3.04 FEEDLINE CABLE SUPPORTS**

- .1 The feedline support system shall include, but not be limited to, a square feedline ladder, vertical running, centrally located support system which shall be co-located with the tower ladder. The vertical, centrally located waveguide support system shall have the capacity to support all of the specified antenna feedlines.
- .2 Locate the feedline support systems in the center of the tower. The feedline support structure shall be fabricated from and supported by rigid members.
- .3 The feedline support systems shall be able to support feedline cushions, feedline support brackets, grounding and lighting cables on 1,000 mm centers. Horizontal structural members shall be capable of supporting a 1.3 kN man. In addition, the members shall be capable of restraining (without damage) a 1.3 kN man who has attached a safety line to a structural member and who has fallen a distance of 2 m.
- .4 The feedline supports shall not be attached to the ladder.

### **3.05 ANCHOR BOLTS**

- .1 Provide tower with galvanized anchor rods according to ASTM F2329, as required to properly anchor the tower and guy members and to resist the calculated maximum loads. Assume a concrete with a compression resistance of 30 MPa.

## **4 SUBMITTALS**

- .1 Provide submittals in accordance with section 01 33 00 within the time limit specified.
- .2 All drawings shall be bilingual.

### **4.01 TOWER DESIGN**

- .1 Provide complete design for the tower and its foundations.
- .2 Provide complete design for cable trays, the structure supporting the cable trays and their foundations.
- .3 Structural calculations

- .1 Structural calculations shall be prepared and stamped by a structural engineer licensed in Quebec.
  - .2 Include computations, internal forces diagrams and other pertinent data so that calculations for individual structural members can be readily interpreted. The computations shall be prefaced by a statement clearly and concisely outlining the basis for the structural design and indicating the manner in which the structure will resist vertical loads and horizontal forces.
  - .3 The computations shall establish that the structure will resist the largest loads and forces specified by CSA S37-13 Standard and this specification. Where unusual conditions occur, such additional data as are relevant to the work shall be submitted.
  - .4 Calculations shall clearly show how all vertical and horizontal loads are transferred from the steel tower to the concrete foundation.
  - .5 The computer analysis software program name and a brief description of the theory used shall be included. The analysis calculations output will include, but not be limited to, the following items clearly labelled and identified:
    - Tower profile representing the graphical analytical model with the bracing configurations.
    - Load forces, uniform and concentrated.
    - Internal forces diagrams.
    - Member sizes and their material.
    - Effective projected areas and weights of appurtenances.
    - Deflection twist and sway at design and operational loads.
    - Maximum forces and design strength of all members.
    - Foundation reaction loads.
    - Calculations for anchor rods design.
  - .6 Calculations for individual structural members shall be organized, tabulated, and properly represented so as to effect individual member design to be clearly, readily, and properly deducible.
- .4 Specification
- .1 Specifications shall indicate the various types of materials that will be used and shall describe the methods not covered in the technical regulations which are to be used to obtain the required quality of the work shown on the plans and as described in the specifications. The grades and materials shall be shown on the drawings for each item.
- .5 Drawings
- .1 Design Plans and Drawings shall clearly and completely show all Tower components, dimensions, welding, antenna types, sizes, weights, and projected areas for wind design; and shall properly be cross-referenced with other drawings. Submit drawings in PDF format.
  - .2 Internal forces diagrams and other pertinent data shall be included in the submittal drawings. Shall also be noted on plans, the design of the tower, and the reactions at the bottom the tour and of each guy anchors.
    - Cross-Reference: Use common, logical, and consistent Cross-Referencing symbols, conventions, and the like.
    - Titles: Identify each and every sheet and drawing.
    - Identification: Shall include the signatory engineering name, title, firm name, address, telephone number, facsimile number, and email address, on lower, right-hand side of each sheet.
    - Drawings shall show all the design loading parameters.

- .3 Provide as a minimum the following scaled and dimensioned drawings complete with parts and hardware lists:
  - Tower and feedline ladder elevations indicating legs, cross members, platforms, guardrails, antenna mounts, etc.
  - Tower anchoring details, sections and plan views.
  - Guy schedules, details and anchoring details.
  - Platform plans, elevations and details for each platform level.
  - Climbing ladder details.
  - Feedline ladder details.
  - Erection details.
  - Antenna layout elevations and plan views. Show the tower elevation with all antennas clearly shown and identified. Provide plan views for each antenna level and clearly show and identify each antenna.
  - Microwave antenna feedline support details.
  - Identifier plate mounting details.
- .4 All the drawings must be bilingual
- .6 Samples
  - .1 Submit two (2) complete samples of identifier plates. Samples will not be returned.
- .7 Bill of Materials
  - .1 The bill of materials shall be included in the fabrication drawings.

#### **4.02 OPERATION AND MAINTENANCE MANUALS**

- .1 Submit all the necessary installation instructions with the tower delivery. The installation instructions must be bilingual.
- .2 At least one month before the end of the contract, submit operation and maintenance manuals. The manual shall be bilingual and include the following:
  - Two (2) copies of all information submitted under submittals, with submittal comments incorporated.
  - Two (2) final copies of all shop drawings, incorporating manufacturing and field changes. Where drawings are larger than 11 by 17 inches, provide the full size drawings neatly folded and installed in 8 1/2 by 11-inch top loading clear plastic sheet protectors. In addition, provide two (2) copies of these drawings reduced to 11 by 17-inch sheet size.
  - Electronic copies in PDF format on two (2) CD-ROM or DVD media.

### **5 QUALITY REQUIREMENTS**

#### **5.01 APPLICABLE DOCUMENTS**

- .1 The following documents form a part of the operational requirements to the extent specified. In the event of conflict between the documents referenced below and the contents of this specification, the most restrictive provisions apply.
  - CSA S37-13 Antennas, Towers and Antenna – Supporting Structures.
  - NBC 2010 edition with supplements.
  - CAN/CSA-S16-14 Limit State Design of Steel Structures including S1651-05 Supplement #1.
  - CAN/CSA G40.20-13/G40.21-13 “General Requirements for rolled or welded structural quality steel / Structural quality steel”

- Canadian Institute of Steel Construction (CISC) Handbook of Steel Construction, 2008, CISC 9th Edition.
- American Society for Testing and Materials (ASTM) applicable sections as listed in this specification, including ASTM A325-14 for bolts.
- CAN/CSAW59-13 Welded Steel Construction (Metal Arc Welding).
- ASTM A123 / A123M-15 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- ASTM F2329 / F2329M-15, Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.
- All Local Building Codes, Rulings and Zoning. Requirements applicable to site.

### **5.02 QUALITY CONTROL IN SHOP**

- .1 Structural steel with resistance to brittle fracture covering the range of design temperatures shall be used. Preference shall be given to WT type steels where available. Structural steel shall be according to CSA-G40.20/G40.21.
- .2 Two (2) certified copies of steel mill reports covering chemical and physical properties of steel used in the works shall be submitted to the Owner.
- .3 Tests for uniformity of coating shall be made from time to time on as many samples as may be considered necessary. Such tests shall be conducted in full accordance with the requirements of the galvanizing standard code specified therein. Two (2) copies of test certificates shall be submitted to the Owner.
- .4 After galvanizing, verify the assembly between the modules (pre-assembled sections) to ensure proper alignment between them before delivery to the site. The supplier must supply a report proving that the modules can be assembled within the prescribed tolerances.

### **5.03 ON SITE QUALITY CONTROL**

- .1 The tower must be installed under the supervision of a tower manufacturer's representative.
- .2 A Manufacturer's representative who must be a qualified field technician shall be present on site to monitor, observe, inspect, to submit Tower Manufacturer's Reports, and ensure that the entire Tower system is installed in accordance to the Tower Manufacturer requirements. This Manufacturer's representative shall be assigned and available through all phases of construction. His responsibilities will include, but not be limited to:
  - Verification of telecommunications tower, anchor locations, and the verticality.
  - Inspection and technical assistance during the construction phase.
- .3 The Tower Manufacturer Reports shall include, but not be limited to, date, time, weather conditions, attendees, conditions observed, solutions to problems.
- .4 Design, drawings, specifications, and calculations, and other pertinent documents, must be prepared by Quebec-licensed Engineers as specified herein.

## **6 FABRICATION**

### **6.01 COMPONENTS**

- .1 All tower members shall be in accordance with the drawings and shall be straight and true. All similar parts shall be interchangeable. Accurately locate all punched holes so that the structure can be erected with a minimum of «drifting». The ends of members shall be cut as required to facilitate assembly. In any bending or reworking of any material, ensure that the method employed do not impair the physical properties of the material.
- .2 Components shall be factory drilled for field assembly, easily erected, capable of being dismantled and re-erected without damage to components.

### **6.02 GALVANIZING**

- .1 All steel items inside and out shall be hot-dip galvanized after fabrication according to ASTM A123 / A123M-15 and ASTM F2329 / F2329M-15. Fabricate units complete or in largest practical sections before galvanizing. No galvanizing shall be permitted on assemblies after being bolted. No machine or shop work shall be allowed after galvanizing (including welding).
- .2 Before galvanizing, the steel shall be thoroughly cleaned of all paint, grease, rust scale or other materials that might interfere with proper binding of zinc with the steel.
- .3 Clean damaged galvanized surfaces. Remove all weld spatter, burns, char, smoke, flux, oil, grease, and other deleterious matter.
- .4 Repair minor damages on galvanized members with rich zinc paint such as Re-galv, Galvalloy, Galvweldalloy, or equal, per manufacturer's published directions.

### **6.03 SHAPES, PLATES AND BARS**

- .1 All structural steels used for the tower structure shall conform to CSA G40.20/G40.21, grade to be specify by the tower fabricator.
- .2 The use of A36 modified material to obtain the 50 ksi minimum yield strength is prohibited. Utilizing mill certifications to obtain minimum yield strengths is prohibited. Yield strengths shall be based upon CSA G40.21 designated minimums. Proper drainage of all moisture and condensation shall be provided for all members. Minimum thickness of any structural steel member shall be 4.8 mm.
- .3 Shapes, plates, and bars shall be hot-rolled structural steel; CSA G40.21. Steel pipe shall be manufactured per ASTM A501 or ASTM A53, Grade B.

### **6.04 ANCHOR BOLTS AND OTHER STRUCTURAL BOLTS**

- .1 All structural bolts and anchor rods used for the tower structure shall conform to A325, A394 or A490. Provide zinc-plated or cadmium-plated bolts throughout except high-strength bolts.
- .2 All bolts shall be preferably A-325 Type 1 high strength bolts. A490 bolts are acceptable in accordance with CISC specifications. All bolts shall be constructed utilizing a Heavy Hex Structural head. All bolts shall be hot dipped in accordance with ASTM F2329-15. All fasteners shall project a minimum of two threads beyond the nut and the nut locking devices when the nut is properly tensioned. Pre-tensioning shall be defined as a snug tight condition unless modified by the

engineer of record.

**6.05 FABRICATION**

- .1 All fabrication shall be in accordance with CISC requirements for fabrication of structural steel and CSA S37-13 Standard.
- .2 Under no circumstances shall "dissimilar metals" be used in contact with one another.
- .3 All welding processes and welding operators shall be qualified in accordance with CSA W59-13 and CSA W47.1-09. Steps shall be taken to ensure that the heat affected zone and the welds meet the brittle fracture requirements of this specification.
- .4 Each separate member shall be distinctly identified by a number assigned to that member. Each member shall be clearly marked with its number to facilitate erection.
- .5 All materials shall be fabricated for a delivery sequence which will expedite erection and minimize field handling of materials.
- .6 The tower must be delivered in pre-assembled sections (modules) to minimize erection on site. The maximum number of modules is 10.
- .7 Provide all the material and labor for the fabrication, transportation, galvanizing and finishing of all fabricated parts, anchor rods, plates, and devices as required or specified for the installation and operation of the tower.
- .8 All furnished materials shall be new and of the best quality as measured by the highest standards of the trade. Any defect shall be cause for rejection.
- .9 The structure and its individual members shall be constructed so that there are no pockets, wells, or traps in which moisture can condense or water collect. Tubular legs shall be sealed at the top of the structure, and weep holes shall be provided where necessary.
- .10 Unless specified otherwise by the designer, straightness and shape of tower members shall meet the tolerances specified in CSA G40.20 after galvanizing.
- .11 Connections: Shop connections shall be bolted and/or welded. Field connections shall be bolted. Tighten nuts for high strength bolts to specifications therefore. Use beveled washers under bolt heads and nuts on beveled surfaces. All threaded fasteners shall extend not less than 1-1/2 threads beyond nuts and locking devices.
- .12 The Manufacturer shall provide assembly bolts, nuts and lock-washers in a quantity in excess of the actual bolt count for each size required for assembly. Provide bolts in excess of 5% but not less than 20 bolts.

**6.06 IDENTIFIER PLATES**

- .1 Elevation Identifier Plates: Provide seven (7) extrusion formed aluminum plate holders complete with seven (7) 65 mm wide by 95 mm high reflective black on yellow aluminum insert plates.
- .2 Tower identification plate: Provide one (1) extrusion formed aluminum plate holder complete with one (1) 65 mm wide by 95 mm high reflective black on yellow aluminum insert plate with

information on the tower model, year of fabrication, etc.

## **7 ERECTION**

### **7.01 HANDLING OF MATERIALS**

- .1 Materials in the plan and on the job site shall be handled and stored in such a manner that no damage shall be done to the materials or any existing building or structure.
- .2 Special care shall be taken to ensure that galvanizing, priming or painting is not damaged during handling and erection of material.
- .3 Minor damage of the galvanized protection coat shall be repaired with rich zinc paint such as Re-galv, Galvalloy, Galvweldalloy, or equal, per manufacturer's published directions.

### **7.02 EXECUTION**

- .1 Erect tower according to manufacturer's directions. Install tower in accordance with OHS requirements.
- .2 Furnish all necessary personnel, supervision, tools, equipment, and transportation required to complete the installation and erection of all items specified herein.
- .3 Any members which are damaged shall be replaced.
- .4 Field modifications including welding or burning of holes in members is not acceptable.
- .5 Install structural members accurately to lines and elevations indicated on the erection drawings. Align and adjust the various members forming each telecommunications tower bay before permanently fastening.
- .6 installation of the cables inside the Tower:
  - Lay the cables separately.
  - Use hosting grip to pull cables, do not put pressure on the cables.
  - Use rollers to pull the cables.
  - Keep a drip curve at the bottom of the tower as well as at the entrance to the buildings.
  - Secure cables to all members of the cable tray using appropriate cable clamps.
- .7 Provide temporary bolts if necessary.
- .8 Coordinate the installation phases with Departmental Representative.
- .9 The contractor shall maintain existing links of the directional antennas in phases 1 and 2.

### **7.03 TOWER PLUMBNESS**

- .1 The tower shall be installed plumb such that the horizontal distance between the center lines at any two elevations shall not exceed 0.25 percent of the vertical distance between the two elevations.

- .2 Maintain tower plumbness during all phases of the erection work. The Contractor shall maintain an assiduous monitoring by measuring plumbness as many time as necessary to comply with the tolerances.
- .3 After complete erection, with all joints tight, all appurtenances installed, and all guys installed, a final check of tower plumbness in the manner prescribed above shall be done as well as guy tension check, and documentation submitted to the Owner. This check must be done at the end of each installation phases.

**7.04 FINISH**

- .1 Special care shall be taken to ensure that galvanizing, priming or painting is not damaged during handling and erection of material.
- .2 In case of minor damage, touch-up galvanized finish that has been damaged with field galvanizing (Re-galv, Galvalloy, Galvweldalloy, or equal) per manufacturer's published directions.

**7.05 ELEVATION IDENTIFIER**

- .1 Tower Elevations: At 6 meters intervals, mount an identifier plate indicating the height at that point. Mount identifier plates on the feedline ladder, facing the access ladder.
- .2 Secure identifier plates with two mounting bands, one at the top and the other at the bottom. Wrap bands completely around posts or structural members.

**END OF SECTION**

**1 GENERAL**

**1.01 RELATED REQUIREMENTS**

- .1 Not Used.

**1.02 REFERENCES**

- .1 ASTM International
  - .1 ASTM D 698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
- .2 CSA International
  - .1 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .3 Ministère des Transports du Québec
  - .1 Cahier des charges et devis généraux (CCDG) : infrastructures routières, Édition 2016.
- .4 U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

**1.03 ACTION AND INFORMATIONAL SUBMITTALS**

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

**2 PRODUCTS**

**2.01 MATERIALS**

- .1 Crushed Granular, Gravel and sand to CCDG.
- .2 Unshrinkable fill: concrete to CSA A23.1/A23.2.

**3 EXECUTION**

**3.01 EXAMINATION**

- .1 Verification of Conditions:
  - .1 Examine soil report in French only available for consultation only in Public works and Government Services Canada offices at 1550 d'Estimauville in Québec.
  - .2 Before commencing work verify locations of buried services on and adjacent to site.
- .2 Evaluation and Assessment:
  - .1 Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.
  - .2 Testing of materials and compaction of backfill and fill will be carried out by testing laboratory designated by Departmental Representative.
  - .3 Not later than 1 week before backfilling or filling, provide to designated testing agency,

- 23 kg sample of backfill and fill materials proposed for use.
- .4 Not later than 72 hours before backfilling or filling with approved material, notify Departmental Representative so that compaction tests can be carried out by designated testing agency.
- .5 Before commencing work, conduct, with Departmental Representative, condition survey of existing structures, trees and plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.

### **3.02 PREPARATION**

- .1 Temporary Erosion and Sedimentation Control:
  - .1 Use temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, in accordance with requirements of authorities having jurisdiction.
  - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
  - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Protection of in-place conditions:
  - .1 Protect excavations from freezing.
  - .2 Keep excavations clean, free of standing water, and loose soil.
  - .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative's approval.
  - .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
  - .5 Protect buried services that are to remain undisturbed.
- .3 Removal:
  - .1 Remove obsolete buried services within 2 m of foundations. Cap cut-offs.
  - .2 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
  - .3 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.
  - .4 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within areas designated on drawings.
  - .5 Remove stumps and tree roots below footings, slabs, and paving, and to 600 mm below finished grade elsewhere.

### **3.03 EXCAVATION**

- .1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial and Municipal regulations.
- .2 No blasting is permitted.
- .3 Topsoil stripping:
  - .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
  - .2 Strip topsoil to depths as directed by Departmental Representative. Avoid mixing topsoil with subsoil.

- .3 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.
- .4 Dispose of topsoil to location as indicated by Departmental Representative.
- .4 Excavate as required to carry out work, in all materials met.
  - .1 Do not disturb soil or rock below bearing surfaces. Notify Departmental Representative when excavations are complete.
  - .2 If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work.
  - .3 Fill excavation taken below depths shown without Departmental Representative's written authorization with concrete of same strength as for footings.

**3.04 SITE QUALITY CONTROL**

- .1 Fill material and spaces to be filled to be inspected and approved by Departmental Representative.

**3.05 BACKFILLING**

- .1 Start backfilling only after inspection and receipt of written approval of fill material and spaces to be filled from Departmental Representative.
- .2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
- .3 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.
- .4 Compaction of subgrade: compact existing subgrade under walks, paving, and slabs on grade, to same compaction as specified for fill. Fill excavated areas with selected subgrade material compacted as specified for fill.
- .5 Placing:
  - .1 Place backfill, fill and basecourse material in 150 mm lifts. Add water as required to achieve specified density.
  - .2 Place unshrinkable fill in areas as indicated. Consolidate and level unshrinkable fill with internal vibrators.
- .6 Compaction: compact each layer of material to following densities for material to ASTM D 698:
  - .1 To underside of basecourses: 95%.
  - .2 Basecourses: 100%.
  - .3 Elsewhere: 90%.
- .7 In trenches:
  - .1 Up to 300 mm above pipe or conduit: sand placed by hand.
  - .2 Over 300 mm above pipe or conduit: native material approved by [Departmental Representative].
- .8 Under seeded and sodded areas: use site excavated material to bottom of topsoil except in trenches and within 600 mm of foundations.
- .9 Blown rock material, not capable of fine grading, is not acceptable, imported material must be placed on this type of material.

- .10 Against foundations (except as applicable to trenches and under slabs and paving): excavated material or imported material with no stones larger than 200 mm diameter within 600 mm of structures.

**3.06 GRADING**

- .1 Grade to ensure that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by Departmental Representative. Grade to be gradual between finished spot elevations as indicated.

**3.07 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Dispose of cleared and grubbed material off site daily.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling.

**END OF SECTION**



**ANNEX 1  
HEALTH AND SAFETY SUBORDINATION AGREEMENT**

**Project:** \_\_\_\_\_ **Address:** \_\_\_\_\_

**EXTERNAL CONTRACTOR**

I hereby agree to submit to the authority of (name of the Principal Contractor's business) \_\_\_\_\_, which is the Principal Contractor for the project indicated above during the entire duration of our work on the construction site. Accordingly, I confirm that I have reviewed the Principal Contractor's prevention program, and I agree to:

- inform my employees of the content of the Principal Contractor's prevention program and ensure that its content are complied with at all times;
- apply the prevention program that is specific to the activities that we carry out under this project;
- inform the Principal Contractor of my actions or dealings on the construction site and obtain the Principal Contractor's agreement before the start of work; and
- follow the health and safety directives provided by the representative of the Principal Contractor on the construction site and, depending on requirements, attend training sessions and health and safety meetings organized by the representative of the Principal Contractor.

Name of representative: \_\_\_\_\_

Name of business: \_\_\_\_\_

Description of work to be done on the construction site: \_\_\_\_\_

Approximate dates of work (start-end): \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**PRINCIPAL CONTRACTOR**

I hereby agree to allow the business (name of external contractor) \_\_\_\_\_ to perform the work under this project indicated above and, as Principal Contractor, to take the necessary steps to protect the health and safety of workers on the construction site. Should the Contractor repeatedly refuse or fail to comply with my directives, I agree to inform PWGSC's Departmental Representative of this and to provide documentary evidence of my actions or dealings with the Contractor.

Name of representative: \_\_\_\_\_

Name of the Principal Contractor's business: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Submit a completed and signed copy to PWGSC's Departmental Representative