NRC·CNRC Administrative Services and Property Management

CNRC·NRC Services administratifs et gestion de l'immobilier

SPECIFICATION

SOLICITATION #:14-22017

BUILDING:	**U-85** **Uplands Campus** **Ottawa, ON**
PROJECT:	**U-85 CNG Filling & Electrical Charging Systems**
PROJECT #:	**U85-3903**
Date:	**April 2014**

SPECIFICATION

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National Research Council Canada	Conseil national de recherches Canada
Administrative Services & Property management Branch (ASPM)	Direction des services administratif et gestion de l'immobilier (SAGI)

Construction Tender Form

Project Identification **U-85 CNG Filling & Electrical Charging Systems**

Tender No.: **14-22017**

1.2 Business Name and Address of Tenderer

Name _____

Address _____

_____

Contact Person(Print Name) _____

Telephone (_____) _____ **Fax:** (_____) _____

1.3 Offer

I/We the Tenderer, hereby offer to Her Majesty the Queen in Right of Canada (hereinafter referred to as "Her Majesty") represented by the National Research Council Canada to perform and complete the work for the above named project in accordance with the Plans and Specifications and other Tender Documents, at the place and in the manner set out therein for the Total Tender Amount (to be expressed in numbers only) of: **$_____. _____ in lawful money of Canada (excluding GST/HST)**

The above amount is inclusive of all applicable (*) Federal, Provincial and Municipal taxes except that in the event of a change in any tax imposed under the Excise Act, the Excise Tax Act, the Old Age Security Act, the Customs Act, the Customs Tariff or any provincial sales tax legislation imposing a retail sales tax on the purchase of tangible personal property incorporated into Real Property, that occurs

.1 after the date this tender was mailed or delivered, or
.2 if this tender is revised, after the date of the last revision

the amount of this offer shall be decreased or decreased in the manner provided for in GC22 of the General Conditions of the Contract Documents.

1.3.1 Offer (continued)

(*) For the purpose of this tender, the Goods and Services Tax (GST) is not to be considered as an applicable tax.

In the province of Quebec, the Quebec Sales Tax is not to be included in the tender amount because the Federal Government is exempt from this tax. Tenderers shall make arrangements directly with the provincial Revenue Department to recover any tax they may pay on good and servives acquired in the performance of this contract. However, tenderers should include in their tender amount Quebec Sales Tax for which an Input Tax Refund is not available.

1.4 Acceptance and Entry into Contract

I/We undertake, within fourteen (14) days of notification of acceptance of my/our offer, to sign a contract for the performance of the work provided I/we are notified, by the Department, of the acceptance of my/our offer within 30 days of the tender closing date.

1.5 Construction Time

I/We Agree to complete the work within the time stipulated in the specification from the date of notification of acceptance of my/our offer.

1.6 Bid Security

I/We herewith enclose tender security in accordance with Article 5 of the General Instruction to Tenderers.

I/We understand that if a security deposit is furnished as tender security and if I/we refuse to enter into a contract when called upon to do so, my/our security deposit shall be forfeited but the Minister may, if it is in the public interest, waive the right of Her Majesty to forfeit the security deposit.

I/We understand that if the security furnished is not in the approved from as described in Article 5 of the General Instructions to Tenderers, my/our tender is subject to disqualification.

1.7 Contract Security

Within fourteen (14) days after receipt of written notification of the acceptance of my/our offer, I/we will furnish contract security in accordance with the Contract Conditions "F" of the Contract Documents.

I/We understand that the contract security referred to herein, if provided in the form of a bill of exchange, will be deposited into the Consolidated Revenue Fund of Canada.

1.8 Appendices

This Tender Form includes Appendix No. _____N/A_____.

1.9 Addenda

The Total Tender Amount provides for the Work described in the following Addenda:

NUMBER	DATE	NUMBER	DATE

(Tenderers shall enter numbers and dates of addenda)

1.10 Execution of Tender

The Tenderer shall refer to Article 2 of the General Instructions to Tenderers.

SIGNED, ATTESTED TO AND DELIVERED on the _____day of _____on behalf of

_____

(Type or print the business name of the Tenderer)

AUTHORIZED SIGNATORY (IES)

_____

(Signature of Signatory)

_____

(Print name & Title of Signatory)

_____

(Signature of Signatory)

_____

(Print name & Title of Signatory)

SEAL

BUYANDSELL NOTICE

U-85 CNG Filling & Electrical Charging Systems

The National Research Council Canada, Uplands Campus, Ottawa, ON has a requirement for a project that includes:

Provide 2 concrete pads and connection rough-ins for and CNG (compressed natural gas) filling station (provided by Enbridge) and electrical charging station (provided by NRC). Final connections of the CNG station to be done by Enbridge, contractor will be responsible for final connection of the charging station

1. GENERAL:
Questions regarding any aspect of the project are to be addressed to and answered only by the Departmental Representative (or his designate) or the Contracting Authority.

Any information received other than from the Departmental Representative (or his designate) or the Contracting Authority will be disregarded when awarding the contract and during construction.

Firms intending to submit tenders on this project should obtain tender documents through the Buyandsell.gc.ca TMA services provider. Addenda, when issued, will be available from the Buyandsell.gc.ca TMA service provider. Firms that elect to base their bids on tender documents obtained from other sources do so at their own risk and will be solely responsible to inform the tender calling authority of their intention to bid. Tender packages are not available for distribution on the actual day of tender closing.

2. MANDATORY SITE VISIT:
It is mandatory that the bidder attends one of the site visits at the designated date and time.
At least one representative from proponents that intend to bid must attend.

The site visits will be held on May 6th and May 8th , 2014 at **9:00** . Meet Don Seabrook at Building U-85, Uplands Campus, Ottawa, ON. Bidders who, for any reason, cannot attend at the specified date and time will not be given an alternative appointment to view the site and their tenders, therefore, will be considered as non-responsive. **NO EXCEPTIONS WILL BE MADE.**

As proof of attendance, at the site visit, the Contracting Authority will have an Attendance Form which MUST be signed by the bidder's representative. It is the responsibility of all bidders to ensure they have signed the Mandatory Site Visit Attendance form prior to leaving the site. Proposals submitted by bidders who have not attended the site visit or failed to sign the Attendance Form will be deemed non-responsive.

3. TENDER CLOSING DATE:
Tender closing date is May 20th , 2014 at 14:00.

4. TENDER RESULTS
Following the Tender closing, the tender results will be sent by facsimile to all Contractors who submitted a tender.

5. SECURITY REQUIREMENT FOR CANADIAN CONTRACTORS

5.1 MANDATORY SECURITY REQUIREMENT:

This procurement contains a mandatory security requirement as follows:

.1 The Contractor must, at all times during the performance of the Contract, hold a valid Designated Organization Screening (DOS), issued by the Canadian Industrial Security Director (CISD), Public Works Government Services Canada.

.2 The Contractor personnel requiring access to sensitive work site(s) must EACH hold a valid RELIABILITY STATUS, granted or approved by CISD/PWGSC.

.3 The Contractor must comply with the provisions of the:

a. Security Requirements Checklist attached at Appendix "D"

b. Industrial Security Manual (Latest Edition) available at: http://ssi-iss.tpsgc-pwgsc.gc.ca/msi-ism/msi-ism-eng.html

5.2 VERIFICATION OF SECURITY CLEARANCE AT BID CLOSING

.1 The Bidder must hold a valid Designated Organization Screening (DOS) issued by the Canadian Industrial Security Directorate (CISD), Public Works and Government Services Canada (PWGSC), TO BE INCLUDED WITH THEIR TENDER OR PROVIDED WITHIN 48 HOURS FROM THE DATE AND TIME OF TENDER CLOSING. Verifications will be made through CISD to confirm the security clearance status of the Bidder. Failure to comply with this requirement will render the bid non-compliant and no further consideration will be given to the bid.

.2 Within 72 hours of tender closing, the General Contractor must name all of his sub-contractors, each of whom must hold a valid RELIABILITY STATUS, granted or approved by CISD/PWGSC, or any other Federal Department or Agency along with the names and birthdates or security clearance certificate numbers of all personnel who will be assigned to the project.

.3 It is to be noted that any subcontractor required to perform any part of the work during the performance of the subsequent contract must also adhere to the mandatory security requirement of the contract. As well, no personnel without the required level of security will be allowed on site. It will be the responsibility of the successful bidder to ensure that the security requirement is met throughout the performance of the contract. The Crown will not be held liable or accountable for any delays or additional costs associated with the contractor's non-compliance to the mandatory security requirement. Failure to comply with the mandatory security requirement will be grounds for being declared in default of contract.

.4 For any enquiries concerning the project security requirement during the bidding period, the Bidder/Tenderer must contact the Security Officer @ 613-993-8956.

6.0 WSIB (WORKPLACE SAFETY AND INSURANCE BOARD)

.1 All Bidders must provide a valid WSIB certificate with their Tender or prior to contract award.

7.0 OFFICE OF THE PROCUREMENT OMBUDSMAN

.1 Dispute Resolution Services
The parties understand that the Procurement Ombudsman appointed pursuant to Subsection 22.1(1) of the *Department of Public Works and Government Services Act* will, on request or consent of the parties to participate in an alternative dispute resolution process to resolve any dispute between the parties respecting the interpretation or application of a term and condition of this contract and their consent to bear the cost of such process, provide to the parties a proposal for an alternative dispute resolution process to resolve their dispute. The Office of the Procurement Ombudsman may be contacted by telephone at 1-866-734-5169 or by e-mail at boa.opo@boa-opo.gc.ca.

.2 Contract Administration
The parties understand that the Procurement Ombudsman appointed pursuant to Subsection 22.1(1) of the *Department of Public Works and Government Services Act* will review a complaint filed by [*the supplier or the contractor or the name of the entity awarded this contract*] respecting administration of this contract if the requirements of Subsection 22.2(1) of the *Department of Public Works and Government Services Act* and Sections 15 and 16 of the *Procurement Ombudsman Regulations* have been met, and the interpretation and application of the terms and conditions and the scope of the work of this contract are not in dispute. The Office of the Procurement Ombudsman may be contacted by telephone at 1-866-734-5169 or by e-mail at boa.opo@boa-opo.gc.ca.

.3 The Office of the Procurement Ombudsman (OPO) was established by the Government of Canada to provide an independent avenue for suppliers to raise complaints regarding the award of contracts under $25,000 for goods and under $100,000 for services. You have the option of raising issues or concerns regarding the solicitation, or the award resulting from it, with the OPO by contacting them by telephone at 1-866-734-5169 or by e-mail at boa.opo@boa-opo.gc.ca. You can also obtain more information on the OPO services available to you at their website at www.opo-boa.gc.ca.

The Departmental Representative or his designate for this project is: **Don Seabrook**
Telephone: **613 991-9874**

Contracting Authority for this project is: **Marc Bédard marc.bedard@nrc-cnrc.gc.ca**
Telephone: **613 993-2274**

INSTRUCTIONS TO BIDDERS

Article 1 – Receipt of Tender

1a) Tenders must be received not later than the specified tender closing time. Tenders received after this time are invalid and shall not be considered, regardless of any reason for their late arrival.

1b) A letter of printed telecommunication from a bidder quoting a price shall not be considered as a valid tender unless a formal tender has been received on the prescribed Tender Form.

1c) Bidders may amend their tenders by letter or printed telecommunication provided that such amendments are received not later than the specified tender closing time.

1d) Any amendments to the tender which are transmitted by telefax must be signed and must clearly identify the tenderer.

All such amendments are to be addressed to:

National Research Council of Canada
Marc Bedard, Senior Contracting Officer
Building M-22
Montreal Road, Ottawa, Ontario
K1A 0R6

Fax: (613) 991-3297

Article 2 – Tender Form & Qualifications

1) All tenders must be submitted on the Construction Tender Form and the tender must be signed in compliance with the following requirements:

a) Limited Company: The full names of the Company and the name(s) and status of the authorized signing officer(s) must be printed in the space provided for that purpose. The signature(s) of the authorized officer(s) and the corporate seal must be affixed.

b) Partnership: The firm name and the name(s) of the person(s) signing must be printed in the space provided. One or more of the partners must sign in the presence of a witness who must also sign. An adhesive coloured seal must be affixed beside each signature.

c) Sole Proprietorship : The business name and the name of the sole proprietor must be printed in the space provided. The sole proprietor must sign in the presence of a witness who must also sign. An adhesive coloured seal must be affixed beside each signature.

2) Any alterations in the printed part of the Construction Tender Form or failure to provide the information requested therein, may render the tender invalid.

3) All space in the Construction Tender Form must be completed and any handwritten or typewritten corrections to the parts so completed must be initialed immediately to the side of the corrections by the person or persons executing the tender on behalf of the the tenderer.

4) Tenders must be based on the plans, specifications and tender documents provided.

Article 3 - Contract

1) The Contractor will be required to sign a contract similar to the Standard Contract Form for Fixed Price Construction Contracts, a blank specimen of which is enclosed in the package for reference purposes.

Article 4 – Tender Destination

1a) Tenders are to be submitted in sealed envelopes to:

National Research Council Canada
Administrative Services and Property Management Branch
1200 Montreal Road
Building M-22
Ottawa, ON K1A 0R6

Endorsed "Tender for (insert title of work as it appears in the drawings and specifications)" and must bear the name and address of the tenderer.

1b) Unless otherwise specified, the only documents required to be submitted with the tender are the Tender form and the Bid Security.

Article 5 - Security

1a) Bid Security is required and must be submitted in one of the following forms:

i) a certified cheque payable to the Receiver General for Canada and

drawn on a member of the Canadian Payments Association or a local cooperative credit society that is a member of a central cooperative credit society having membership in the Canadian Payments Association; **OR**

ii) bonds of the Government of Canada, or bonds unconditionally guaranteed as to principal and interest by the Government of Canada; **OR**

iii) a bid bond.

1b) Regardless of the Bid Security submitted, it should never be more than $250,000 maximum, calculated at 10% of the first $250,000 of the tendered price, plus 5% of any amount in excess of $250,000.

2a) Bid Security shall accompany each tender or, if forwarded separately from the tender, shall be provided not later than the specified tender closing time. Bid Security must be in the ORIGINAL form. Fax or photocopies and NOT acceptable. FAILURE TO PROVIDE THE REQUIRED BID SECURITY SHALL INVALIDATE THE TENDER.

2b) If the tender is not accepted, the Bid Security submitted pursuant to Article 8 shall be returned to the tenderer.

3a) The successful tenderer is required to provide security within 14 days of receiving notice of tender acceptance. The tenderer must furnish EITHER:

i) a Security Deposit as described in 1(b) above together with a Labour and Material Payment Bond in the amount of at least 50% of the amout payable under the contract, OR

ii) a Performance Bond and a Labour and Material Payment Bond – each in the amount of 50% of the amount payable under the contract.

3b) Should it not be possible to obtain a Labour Material Payment Bond as required under 3(a) above, on making application thereof to at least two acceptable Bonding Companies, an additional Security Deposit of a straight 10% of the amount payable under the contract must be furnished.

3c) Where a tender has been accompanied by a Security Deposit, as described in 1(b) above, the amount of the Security Deposit required under 3(a) above may be reduced by the amount of the Security Deposit which accompanied the tender.

3d) Bonds must be in an approved form and from the companies whose

bonds are acceptable to the Government of Canada. Samples of the approved form of Bid Bond, Performance Bond and Labour and Material Payment Bond and a list of acceptable Bonding Companies may be obtained from the Contracting Officer, National Research Council, Building M-22, Montreal Road, Ottawa, Ontario, K1A 0R6.

Article 6 – Interest On Security Deposits

1) Tenderers are notified that they must make their own arrangements with their bankers as to the interest, if any, on the amount of the certified cheque accompanying their tender. The Council will not pay interest on said cheque pending the awarding of the contract nor be responsible for the payments of interest under any arrangement made by the tenderers.

Article 7 – Sales Tax

1) The amount of the tender shall include all taxes as levied under the Excise Act, the Excise Tax Act, the Old Age Security Act, the Customs Act or the Customs Tariff, in force or applicable at the time.

2) In Quebec, the Provincial Sales Tax should not be included in the Tender Price as the Federal Government is exempt. Tenderers should contact the Provincial Revenue Minister to recover all taxes paid for goods and services rendered under this contract.

Tenderers must include in their Tender Price the amount of Provincial Sales Tax for which the exemption does not apply.

Article 8 – Examination of Site

1) All parties tendering shall examine the sites of the proposed work before sending in their tender and make themselves thoroughly acquainted with the same and obtain for themselves any and all information that may be necessary for the proper carrying out of the Contract. No after claim will be allowed or entertained for any work or material that may be requisite and necessary for the proper execution and completion of this Contract with the exception of that provided for under GC 35 in the General Conditions of the General Specification.

Article 9 – Discrepancies, Omissions, Etc.

1a) Bidders finding discrepancies in, or omissions from, drawings, specifications or other documents, or having any doubt as to the meaning or intent of any part thereof, should at once notify the Engineer who will

send written instructions or explanation to all bidders.

1b) Neither the Engineer nor the Council will be responsible for oral instructions.

1c) Addenda or corrections issued during the time of the bidding shall be covered in the proposal. However, the contract supersedes all communications, negotiations and agreements, either written or oral, relating to the work and made prior to the date of the contract.

Article 10 – No additional Payments for Increased Costs

1) The only other adjustments in the contract price allowed are those specified in the General Conditions of the General Specification. The contract price will not be amended for change in freight rates, exchange rates, wage rates or cost of materials, plant or services.

Article 11 – Awards

1a) The Council reserves the power and right to reject tenders received from parties who cannot show a reasonable acquaintance with and preparation for the proper performance of the class of work herein specified and shown on plans. Evidence of such competence must be furnished by the tenderers if required to do so.

1b) A tenderer may be required to furnish to the Contracting Office, National Research Council of Canada, Building M-22, 1200 Montreal Road, Ottawa, Ontario, K1A 0R6, Canada, unsigned copies of the insurance requirements as covered by the Insurance Conditions of the General Specification.

1c) The Council does not bind itself to accept the lowest or any tender.

Article 12 – Harmonized Sales Tax

1) The Harmonized Sales Tax (HST) which in now in effect shall be considered an applicable tax for the purpose of this tender. However, the bidder shall NOT include any amount in the bid price for said HST. The successful contractor will indicate on each application for payment as a separate amount the appropriate HST the Owner is legally obliged to pay. This amount will be paid to the Contractor in addition to the amount certified for payment under the Contract in addition to the amount certified for payment under the Contract and will therefore not affect the Contract Price. The Contractor agrees to remit any HST collected or due to Revenue Canada.

Non-Resident Contractors

RST Guide 804
Published: August 2006
Content last reviewed: August 2010
ISBN: 1-4249-2007-8 (Print), 1-4249-2009-4 (PDF), 1-4249-2008-6 (HTML)

Publication Archived

Notice to the reader: For Retail Sales Tax (RST) – On July 1, 2010 the 13 per cent Harmonized Sales Tax (HST) took effect in Ontario replacing the existing provincial Retail Sales Tax (RST) and combining it with the federal Goods and Services Tax (GST). As a result, RST provisions described on this page and in other publications ended on June 30, 2010.

Effective July 1, 2010 this publication was archived for RST purposes **only**. Use caution when you refer to it, since it reflects the law in force for RST at the time it was released and may no longer apply.

- The information in this Guide explains the Retail Sales Tax (RST) responsibilities of a non-resident contractor who is awarded a construction contract to perform work in Ontario and their Ontario customers. Please note that this Guide replaces the previous version dated March 2001.

Non-Resident Contractor Defined

A non-resident contractor is a contractor located outside Ontario who has been awarded a construction contract to perform work in Ontario, and who has not maintained a permanent place of business in Ontario continuously for twelve months immediately prior to signing the contract, or which is not a company incorporated under the laws of Ontario. A construction contract is a contract for the erection, remodelling or repair of a building or other structure on land.

A contractor is a person who is in the business of constructing, altering, repairing or improving real property and includes, but is not limited to,

1. a general contractor and subcontractor,
2. a carpenter, bricklayer, stonemason, electrician, plasterer, plumber, painter, decorator, paver, and bridge builder,
3. a sheet metal, tile and terrazzo, heating, air conditioning, insulation, ventilating, papering, road, roofing and cement contractor,

who installs or incorporates items into real property. (See RST Guide 206 - Real Property and Fixtures).

Registration and Guarantee Deposit

Non-resident contractors who are awarded a construction contract in Ontario are required to register with the Ministry of Finance (ministry), Centralized Programs Unit and post a guarantee equal to 4 per cent of the total of each Ontario contract. The guarantee can be paid in cash, by certified cheque (payable to the Minister of Finance), letter of credit or by a guarantee bond.

To register with the ministry and to obtain further information on posting a guarantee, contractors should contact the ministry's Centralized Programs Unit, 33 King Street West, PO Box 623, Oshawa, Ontario, L1H 8H7, toll-free 1 866 ONT-TAXS (1 866 668-8297) or fax to 905 435-3617.

Non-resident contractors who sell taxable goods on a supply only basis to Ontario customers, or provide taxable services in Ontario, may obtain a regular Vendor Permit to collect and remit RST on their sales. Non-resident contractors who have been issued a regular Vendor Permit must still register separately with the ministry and post a guarantee if they are awarded a construction contract in Ontario.

Letter of Compliance

After receiving the guarantee, the ministry mails out two copies of a "letter of compliance" to the contractor certifying the Retail Sales Tax (RST) requirements have been met. Contractors must give a copy of the letter to their customers.

If a copy of the compliance letter is not provided, the customer must withhold 4 per cent of all amounts payable to the non resident contractor and pay the withheld amounts to the Minister of Finance (minister). Details relating to the contract should be sent along with the payments to the Centralized Programs Unit. Customers may give the minister a guarantee bond equal to 4 per cent of the total contract price instead of making the 4 per cent payments.

Note: Customers who do not follow these requirements may be held liable for 4 per cent of all amounts payable to the non resident contractor or any other amount that the Ministry deems to be the RST payable resulting from the performance of the contract.

Calculation of RST

Fair Value

RST is payable on the "fair value" of materials, purchased or brought into Ontario, to be used for work performed in Ontario. "Fair value" includes:

- the purchase price in Canadian funds;
- all charges by the supplier for handling and delivery, and
- any federal customs duties and excise taxes paid (but not the federal Goods and Services Tax (GST)).

Contractors are also required to pay RST to Ontario suppliers on the purchase, rental or lease of taxable services, materials, machinery, or equipment.

Machinery and Equipment - Leased

If machinery or equipment is leased from a supplier outside Ontario and brought into the province, RST is payable on the lease payments for the period the machinery or equipment is in Ontario.

Machinery and Equipment - Owned by Contractor

If machinery or equipment is owned by the contractor, RST may be calculated in one of the following ways:

a. If a contractor brings machinery and equipment into Ontario for less than 12 months' use, RST is to be calculated using the following formula:

   1/36 × net book value at date of import × number of months in Ontario × tax rate

   For the purpose of this formula, RST is payable for each month or part of a month that the goods are in Ontario. A month is considered 31 consecutive days and a part month is considered more than 12 days. The RST payable is based on the number of days the machinery and equipment are located in Ontario and not the number of days the items are actually used.

Example: Equipment is brought into Ontario on March 28 and taken out on May 8. The items were in the province for 41 days. RST is payable on the first 31 days' temporary stay in Ontario vs. use of the equipment. Since the remainder (10 days) is not considered part of a month, no RST is payable on this portion.

b. If, at the time the goods are brought into Ontario, it is expected that the machinery or equipment will be in Ontario for more than twelve months, contractors must pay Retail Sales Tax (RST) on the following basis:

   net book value at date of import × tax rate

   If, at the time of import, the length of time is not known, vendors may use the formula under (a). If they later find it necessary to keep the machinery and equipment in Ontario for more than 12 months, the RST paid under (a) may be deducted from the RST payable under (b).

Using formula (a) or (b) above, contractors will calculate and remit the RST payable on the return that is filed when the contract is finished.

(See Completion of Contract section)

Manufacturing for Own Use

Contractors may need to manufacture items, such as doors and windows, for their construction contracts. Manufacturing is work done in a factory away from a construction

site, or in a mobile unit or workshop that is on or near the construction site. Manufacturing occurs when raw materials are changed into manufactured goods for use in real property contracts.

Contractors are considered to be manufacturing contractors if they produce goods:

1. for their own use in real property contracts, and
2. the manufactured cost of the goods is more than $50,000 a year.

(See RST Guide 401 - Manufacturing Contractors)

Contracts with the Federal Government

Where a non-resident contractor enters into a construction contract with the federal government, for the construction of a building and/or the installation of equipment, the nature of the equipment will determine whether the contract should be let on a tax-included or tax excluded basis.

Contracts for the construction of a building and the installation of equipment that directly services that building (i.e., elevators, escalators, light fixtures, central heating and air conditioning, etc.) should be tendered on a tax -included basis. Contractors are the consumers of the materials used in fulfilling these contracts and must pay or account for RST on the materials used to complete the contracts. There is NO exemption just because the contract is with the federal government.

Contracts for the installation of equipment that becomes a fixture and does not directly service a building (i.e., material handling equipment, production machinery, communication equipment, training equipment) may be tendered on a tax-excluded basis. Contractors engaged in contracts of this nature are permitted to make tax exempt purchases of such equipment by issuing a valid Purchase Exemption Certificate (PEC) to their supplier. Only non-resident contractors who have registered with the ministry and posted a guarantee may issue a PEC.

Exemptions

Contractors may supply and install equipment or materials for certain customers that may be entitled to an exemption from RST (e.g., manufacturers, Indian band councils, farmers and diplomatic organizations). The equipment or materials, when installed, becomes real property if it is permanently attached to land, or a fixture if it is permanently attached to a building or real property structure. Since contractors are liable for RST, they should contact the ministry to find out if the customer qualifies for exemption before tendering the contract on a tax-excluded basis.

Status Indians, Indian Bands and Band Councils

Non-resident contractors may purchase building materials exempt from Retail Sales Tax (RST) for certain buildings and structures situated on reserves. The cost of such projects must be paid by the band council, and the buildings must provide a community service for

the reserve. Contracts for the construction of an exempt community building project should be made on an RST-excluded basis. Non-resident contractors may purchase the materials exempt from RST by providing suppliers with a valid Purchase Exemption Certificate (PEC). As noted previously, only non-resident contractors who have registered with the ministry and posted a guarantee may issue a PEC. (See RST Guide 204 - Purchase Exemption Certificates).

Non-resident contractors must pay RST on items purchased for incorporation into a building or structure built for individual status Indians on a reserve. (See RST Guide 808 - Status Indians, Indian Bands and Band Councils).

Completion of Contract

When a contract is completed, non-resident contractors who were required to post a guarantee must complete a Non-Resident Contractor Retail Sales Tax Return [PDF - 92 KB] that is provided by the ministry.

If a contractor's guarantee was given in cash or by certified cheque, the amount of the deposit can be deducted from the RST liability owed by the contractor. If the liability is greater than the deposit, the amount remaining must be paid by the contractor. If the deposit is more than the liability, the contractor will receive a refund.

If a guarantee bond was posted instead of cash, the bond will be discharged once the RST liability is paid in full.

All returns are subject to audit.

Legislative References

- Retail Sales Tax Act, Subsections 19(2) and 39(3)(4) and (5)
- Regulation 1012 under the Act, Subsections 15.3(1)(2)(5)(6) and (7)
- Regulation 1013 under the Act, Sections 1 and 3

For More Information

The information contained in this publication is only a guideline. For more information, please contact the Ontario Ministry of Finance at 1 866 ONT-TAXS (1 866 668-8297) or visit our website at ontario.ca/finance.

Acceptable Bonding Companies

Published September 2010

The following is a list of insurance companies whose bonds may be accepted as security by the government.

1. Canadian Companies

ACE INA Insurance
Allstate Insurance Company of Canada
Ascentus Insurance Ltd. (Surety only)
Aviva Insurance Company of Canada
AXA Insurance (Canada)
AXA Pacific Insurance Company
Canadian Northern Shield Insurance Company
Certas Direct Insurance Company (Surety only)
Chartis Insurance Company of Canada (formerly AIG Commercial Insurance Company of Canada)
Chubb Insurance Company of Canada
Commonwealth Insurance Company
Co-operators General Insurance Company
CUMIS General Insurance Company
The Dominion of Canada General Insurance Company
Echelon General Insurance Company (Surety only)
Economical Mutual Insurance Company
Elite Insurance Company
Everest Insurance Company of Canada
Federated Insurance Company of Canada
Federation Insurance Company of Canada
Gore Mutual Insurance Company
Grain Insurance and Guarantee Company
The Guarantee Company of North America
Industrial Alliance Pacific General Insurance Corporation
Intact Insurance Company
Jevco Insurance Company (Surety only)
Lombard General Insurance Company of Canada
Lombard Insurance Company
Markel Insurance Company of Canada
The Missisquoi Insurance Company
The Nordic Insurance Company of Canada
The North Waterloo Farmers Mutual Insurance Company (Fidelity only)
Novex Insurance Company (Fidelity only)
The Personal Insurance Company
Pilot Insurance Company
Quebec Assurance Company
Royal & Sun Alliance Insurance Company of Canada
Saskatchewan Mutual Insurance Company
Scottish & York Insurance Co. Limited
The Sovereign General Insurance Company
TD General Insurance Company
Temple Insurance Company
Traders General Insurance Company
Travelers Guarantee Company of Canada
Trisura Guarantee Insurance Company
The Wawanesa Mutual Insurance Company
Waterloo Insurance Company

Western Assurance Company
Western Surety Company

2. Provincial Companies

– Surety bonds issued by the following companies may be accepted provided that the contract of suretyship was executed in a province in which the company is licensed to do business as indicated in brackets.
– AXA Boreal Insurance Company (P.E.I., N.B., Que., Ont., Man., B.C.)
AXA Boreal Insurance Company (P.E.I., N.B., Que., Ont., Man., B.C.)
ALPHA, Compagnie d'Assurances Inc. (Que.)
Canada West Insurance Company (Ont., Man., Sask, Alta., B.C., N.W.T.) (Surety only)
The Canadian Union Assurance Company (Que.)
La Capitale General Insurance Inc. (Nfld. & Lab., N.S., P.E.I., Que.(Surety only), Man., Sask., Alta., B.C., Nun., N.W.T., Yuk.)
Coachman Insurance Company (Ont.)
Continental Casualty Company (Nfld. & Lab., N.S., P.E.I., N.B., Que., Ont., Man., Sask., Alta., B.C., Nun., N.W.T., Yuk.)
GCAN Insurance Company (Nfld. & Lab., N.S., P.E.I., N.B., Que., Ont., Man., Sask., Alta., B.C., Nun., N.W.T., Yuk.)
The Insurance Company of Prince Edward Island (N.S., P.E.I., N.B.)
Kingsway General Insurance Company (N.S., N.B., Que., Ont., Man., Sask., Alta., and B.C.)
Liberty Mutual Insurance Company (Nfld. & Lab., N.S., P.E.I., N.B., Que., Ont., Man., Sask., Alta., B.C., Nun., N.W.T., Yuk.)
Manitoba Public Insurance Corporation (Man.)
Norgroupe Assurance Générales Inc.
Orleans General Insurance Company (N.B., Que., Ont.)
Saskatchewan Government Insurance Office (Sask.)
SGI CANADA Insurance Services Ltd. (Ont., Man., Sask., Alta.)
L'Unique General Insurance Inc. (Nfld. & Lab., N.S., P.E.I., N.B., Que.(Surety only), Ont.(Surety only), Man., Sask., Alta., B.C.(Surety only), Nun., N.W.T., Yuk.)

3. Foreign Companies

– Aspen Insurance UK Limited
Compagnie Française d'Assurance pour le Commerce Extérieur (Fidelity only)
Eagle Star Insurance Company Limited
Ecclesiastical Insurance Office Public Limited Company (Fidelity only)
Lloyd's Underwriters
Mitsui Sumitomo Insurance Company, Limited
NIPPONKOA Insurance Company, Limited
Sompo Japan Insurance Inc.
Tokio Marine & Nichido Fire Insurance Co., Ltd.
XL Insurance Company Limited (Surety only)
Zurich Insurance Company Ltd

Articles of Agreement

Standard Construction Contract – Articles of Agreement
(23/01/2002)

A1 Contract Documents

A2 Date of Completion of Work and Description of Work

A3 Contract Amount

A4 Contractor's Address

A5 Unit Price Table

Articles of Agreement

These Articles of Agreement made in duplicate this day of .

Between

Her Majesty the Queen, in right of Canada (referred to in the contract documents as " Her Majesty") represented by the National Research Council Canada (referred to in the contract documents as the "Council")

and

(referred to in the contract documents as the "Contractor")

Witness that in consideration for the mutual promises and obligations contained in the contract, Her Majesty and the Contractor covenant and agree as follows:

A1 Contract Documents
(23/01/2002)

1.1 Subject to A1.4 and A1.5, the documents forming the contract between Her Majesty and the Contractor, referred to herein as the contract documents, are

1.1.1 these Articles of Agreement,

1.1.2 the document attached hereto, marked "A" and entitled "Plans and Specifications", referred to herein as the Plans and Specifications,

1.1.3 the document attached hereto, marked "B" and entitled "Terms of Payment", referred to herein as the Terms of Payment,

1.1.4 the document attached hereto, marked "C" and entitled "General Conditions", referred to herein as the General Conditions,

1.1.5 the document attached hereto, marked "D" and entitled "Labour Conditions", referred to herein as the Labour Conditions,

1.1.6 the document attached hereto, marked "E" and entitled "Insurance Conditions", referred to herein as the Insurance Conditions,

1.1.7 the document attached hereto, marked "F" and entitled "Contract Security Conditions", referred to herein as the Contract Security Conditions, and

1.1.8 any amendment or variation of the contract documents that is made in accordance with the General Conditions.

1.1.9 the document entitled Fair Wage Schedules for Federal Construction Contracts referred to herein as Fair Wage Schedules

Articles of Agreement

The Council hereby designates of
of the Government of Canada as the Engineer for the purposes of the contract, and for all purposes of or incidental to the contract, the Engineer's address shall be deemed to be:

1.2 **In the contract**

1.3.1 " Fixed Price Arrangement" means that part of the contract that prescribes a lump sum as payment for performance of the work to which it relates; and

1.3.2 " Unit Price Arrangement" means that part of the contract that prescribes the product of a price multiplied by a number of units of measurement of a class as payment for performance of the work to which it relates.

1.3 Any of the provisions of the contract that are expressly stipulated to be applicable only to a Unit Price Arrangement are not applicable to any part of the work to which a Fixed Price Arrangement is applicable.

1.4 Any of the provisions of the contract that are expressly stipulated to be applicable only to a Fixed Price Arrangement are not applicable to any part of the work to which a Unit Price Arrangement is applicable.

A2 Date of Completion of Work and Description of Work
(23/01/2002)

2.1 The contractor shall, between the date of these Articles of Agreement and the , in the careful and workmanlike manner, diligently perform and complete the following work:

which work is more particularly described in the Plans and Specifications,

Articles of Agreement

A3 Contract Amount
(23/01/2002)

3.1 Subject to any increase, decrease, deduction, reduction or set-off that may be made under the Contract, Her Majesty shall pay the Contractor at the times and in the manner that is set out or referred to in the Terms of Payment

3.1.1 the sum of (GST/HST extra), in consideration for the performance of the work or the part thereof that is subject to Fixed Price Arrangement, and

3.1.2 a sum that is equal to the aggregate of the products of the number of units of Measurement of each class of labour, plant and material that is set out in a Final Certificate of Measurement referred to in GC44.8 multiplied in each case by the appropriate unit price that is set out in the Unit Price Table in consideration for the performance of the work or the part thereof that is subject to a Unit Price Arrangement.

3.2 For the information and guidance of the Contractor and the persons administering the contract on behalf of Her Majesty, but not so as to constitute a warranty , representation or undertaking of any nature by either party, it is estimated that the total amount payable by Her Majesty to the Contractor for the part of the work to which a Unit Price Arrangement is applicable will be approximately $N/A

3.3 A3.1.1 is applicable only to a Fixed Price Arrangement.

3.4 A3.1.2 and A3.2 applicable only to a Unit Price Arrangement.

A4 Contractor's Address
(23/01/2002)

4.1 For all purposes of or incidental to the contract, the Contractor's address shall be deemed to be:

Articles of Agreement

A5 Unit Price Table
(23/01/2002)

5.1 Her Majesty and the Contractor agree that the following table is the Unit Price Table for the purposes of the contract.

Column 1 Item	**Column 2** Class of Labour Plant Or Material	**Column 3** Unit of Measurement	**Column 4** Estimated Total Quantity	**Column 5** Price per Unit	**Column 6** Estimated Total Price
		N/A			

5.2 The Unit Price Table that is set out in A5.1 designates the part of the work to which a Unit Price Arrangement is applicable.

5.3 The part of the work that is not designated in the Unit Price Table referred to in A5.2 is the part of the work to which a Fixed Price Arrangement is applicable.

Articles of Agreement

Signed on behalf of Her Majesty by

_____

as Senior Contracting Officer

and _____

as _____

of the **National Research Council Canada**

on the _____

day of _____

Signed, sealed and delivered by

_____

as _____ and
Position

by _____

as _____
Position

of

on the _____

day of _____

Seal

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END OF TABLE

1. SCOPE OF WORK

.1 Work under this contract covers the installation of a natural gas filling station and electrical charging station in the Council's Surface Transportation Campus of the National Research Council.

2. WORK & MATERIALS SUPPLIED BY OWNER

.1 Work and materials not included in this contract are described on drawings and in this specification.

.2 Deliver to a storage place, as directed by the Departmental Representative, all materials returned to the Owner.

.3 Unless otherwise specified, accept owner-supplied materials at their storage location and provide all transportation as required.

.4 Contractor's duties:

.1 Unload at site.

.2 Promptly inspect products and report damaged or defective items.

.3 Give written notification to the Departmental Representative for items accepted in good order.

.4 Handle at site, including uncrating and storage.

.5 Repair or replace items damaged on site.

.6 Install, connect finished products as specified.

3. LABOUR CONDITIONS AND FAIR WAGE SCHEDULE

.1 Comply with all labour conditions as specified by the Human Resources Development Canada, Labour Program, including those outlined in Appendix "D", Labour Conditions and Fair Wage Schedule.

4. WORKPLACE HAZARDOUS MATERIAL INFORMATION SYSTEM (WHMIS)

.1 The contractor shall comply with Federal and Provincial legislation regarding the WHMIS. The contractor's responsibilities include, but are not limited to the following:

.1 To ensure that any controlled product brought on site by the contractor or sub-contractor is labeled;

.2 To make available to the workers and the Departmental Representative, Material Safety Data Sheets (MSDS) for these controlled products;

.3 To train own workers about WHMIS, and about the controlled products that they use on site;

.4 To inform other contractors, sub-contractors the Departmental Representative, authorized visitors and outside inspection agency personnel about the presence and use of such products on the site; and

.5 The site foreman or superintendent must be able to demonstrate, to the satisfaction of the Departmental Representative, that he/she has had WHMIS training and is

knowledgeable in its requirements. The Departmental Representative can require replacement of this person if this condition or implementation of WHMIS is not satisfactory.

5. EXAMINATION REQUIREMENTS OF BILL 208, SECTION 18(a)

.1 Under the requirements of Bill 208 of the Ministry of Labour Occupational Health & Safety Act, the following designated substances may be encountered while performing the work described in these contract documents:

.1 None

6. GENERAL

.1 The word "provide" indicated in this Specification means to supply and install. Site Examination

7. COMPLETION

.1 All work is to be completed within 10 week(s) upon receipt of notification of acceptance of tender.

8. COST BREAKDOWN

.1 Submit, for approval by the Departmental Representative, a breakdown of tender before submitting the first request for progress payment.

.2 Use the approved cost breakdown as the basis for submitting all claims.

.3 Request Departmental Representative's verbal approval to amount of claim prior to preparing and submitting the claim in its final form.

9. MATERIALS AND WORKMANSHIP

.1 Install only new materials on this project unless specifically noted otherwise.

.2 Only first class workmanship will be accepted, not only with regard to safety, efficiency, durability, but also with regard to neatness of detail and performance. Security Deposit.

10. SUB-TRADES

.1 Submit no later than 72 hours after tender closing, a complete list of sub trades for the Departmental Representative's review.

11. SITE VISITS

.1 For tendering purposes, the site visit(s) must be attended in the presence of the Departmental Representative.

12. MINIMUM STANDARDS

.1 Conform to or exceed minimum acceptable standards of the various applicable federal, provincial and municipal codes such as The National Building Code, The National Fire Code, Canadian Plumbing Code, Canadian Electrical Code, Canadian Code for Construction Safety and the Provincial Construction Safety Act.

.2 Work to conform to referenced standards and codes as reaffirmed or revised to date of specification.

13. FIRE AND GENERAL SAFETY

.1 Comply with the requirements of Fire Commissioner of Canada Standards No. 301 and 302.

.2 Comply with the requirements of the National Research Council, Fire Prevention Officer including those outlined in Section 01545.

.3 Comply with safety related instructions from the Departmental Representative or the National Research Council, Fire Prevention Officer.

.4 Comply with the National Building Code (Part 8, Construction Safety Measures) and the Provincial Construction Safety Act.

14. PROTECTION AND WARNING NOTICES

.1 Provide all materials required to protect existing equipment.

.2 Erect dust barriers to prevent dust and debris from spreading through the building.

.3 Place dust protection in the form of cover sheets over equipment and furniture and tape these sheets to floors, to ensure no dust infiltration.

.4 Repair or replace any and all damage to Owner's property caused during construction, at no cost to the Owner and to the satisfaction of the Departmental Representative.

.5 Protect the buildings, roads, lawns, services, etc. from damage which might occur as a result of this work.

.6 Plan and co-ordinate the work to protect the buildings from the leakage of water, dust, etc.

.7 Ensure that all doors, windows, etc., that could allow transfer of dust, noise, fumes, etc., to other areas of the building are kept closed.

.8 Secure working area at the end of each day's work and be responsible for the same.

.9 Provide and maintain adequate safety barricades around the work sites to protect NRC personnel and the public from injury during the carrying out of work.

.10 Post warnings in all instances where possible injury could occur such as Work Overhead, Hard Hat Areas, etc. or as required by the Departmental Representative.

.11 Provide temporary protective enclosures over building entrances and exits to protect pedestrians. All enclosures to be structurally sound against weather and falling debris.

15. FASTENING DEVICES

.1 Do not use explosive actuated tools, unless permitted expressly by the Departmental Representative.

.2 Comply with the requirements of CSA A-166 (Safety Code for Explosive Actuated Tools).

.3 Do not use any kind of impact or percussion tool without first obtaining permission from the Departmental Representative.

16. BILINGUALISM

.1 Ensure that all signs, notices, etc. are posted in both official languages.

.2 Ensure that all identification of services called for by this contract are bilingual.

17. TEMPORARY HEATING AND VENTILATING

.1 Bear the costs of temporary heat and ventilation during construction including costs of installation, fuel, operation, maintenance, and removal of equipment.

.2 Use of direct-fired heaters discharging waste products into the work areas will not be permitted unless prior approval is given by the Departmental Representative.

.3 Furnish and install temporary heat and ventilation in enclosed areas as required to:

.1 Facilitate progress of work.

.2 Protect work and products against dampness and cold.

.3 Reduce moisture condensation on surfaces to an acceptable level.

.4 Provide ambient temperature and humidity levels for storage, installation and curing of materials.

.5 Provide adequate ventilation to meet health regulations for a safe working environment.

.4 Maintain minimum temperature of 10 ^{o}C (50 ^{o}F) or higher where specified as soon as finishing work is commenced and maintain until acceptance of the structure by the Departmental Representative. Maintain ambient temperature and humidity levels as required for comfort of NRC personnel.

.5 Prevent hazardous or unhealthy accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction including also, storage areas and sanitary facilities.

.1 Dispose of exhaust materials in a manner that will not result in a harmful or unhealthy exposure to persons.

.6 Maintain strict supervision of operation of temporary heating and ventilating equipment.

.1 Enforce conformance with applicable codes and standards.

.2 Comply with instructions of NRC Fire Prevention Officer including provision of full-time watchmen services when directed.

.3 Enforce safe practices.

.4 Vent direct-fired combustion units to outside.

.7 Submit tenders assuming existing or new equipment and systems will not be used for temporary heating and ventilating.

18. DISCREPANCIES & INTERFERENCES

.1 Before tender closing, examine drawings and specifications. Report at once to the Departmental Representative, any defects, discrepancies, omissions or interferences affecting the work.

.2 Provide items mentioned in either the drawings or the specification.

.3 Contractor to immediately inform the Departmental Representative in writing, of any discrepancies between the plans and the physical conditions so the Departmental Representative may promptly verify same.

.4 Any work done after such a discovery, until authorized, is at the contractor's risk.

.5 Where special interferences are encountered on the job and they have not been pointed out on the original tender or on the plans and specifications, provide offsets, bends or reroute the services to suit job conditions at no extra cost.

.6 Arrange all work so as not to interfere in any way with other work being carried out.

.7 Commencement of work will imply an acceptance of existing conditions.

19. CO-OPERATION

.1 Co-operate with NRC staff in order to keep disruption of normal research work to an absolute minimum.

.2 Work out in advance, a schedule for all work which might disrupt normal work in the building.

.3 Have schedule approved by the Departmental Representative.

.4 Notify the Departmental Representative in writing, 72 hours prior to any intended interruption of facilities, areas, corridors, mechanical or electrical services and obtain requisite permission.

20. GENERAL REVIEW

.1 Periodic review of the contractor's work by the Departmental Representative, does not relieve the contractor of the responsibility of making the work in accordance with contract documents. Contractor shall carry out his own quality control to ensure that the construction work is in accordance with contract documents.

21. INSPECTION OF BURIED OR CONCEALED SERVICES

.1 Prior to concealing any services that are installed, ensure that all inspection bodies concerned, including NRC, have inspected the work and have witnessed all tests. Failure to do so may result in exposing the services again at the contractor's expense.

22. TESTING

.1 On completion, or as required by local authority inspectors and/or Departmental Representative during progress of work and before any services are covered up and flushing is complete, test all installations in the presence of the Departmental Representative.

.2 Obtain and hand to the Departmental Representative all acceptance certificates or test reports from authority having jurisdiction. The project will be considered incomplete without the same.

23. WORKING HOURS AND SECURITY

.1 Normal working hours on the NRC property are from 8:00 a.m. until 4:30 p.m., Monday to Friday inclusive except statutory holidays.

.2 At all other times, special written passes are required for access to the building site.

.3 Obtain permission from the Departmental Representative to perform the specific tasks before scheduling any work outside normal working hours.

.4 An escort may be required whenever working outside normal hours. Contractor to bear the associated costs.

.5 All persons employed by the contractor, or by any subcontractor, and working on the site must wear and keep visible identification badges issued by the Council.

24. SCHEDULE

.1 The contractor shall prepare a detailed schedule, fixing the date for commencement and completion of the various parts of the work and update the said schedule. Such schedule shall be made available to the Departmental Representative not later than two weeks after the award of the contract and prior to commencement of any work on site.

.2 Notify Departmental Representative in writing of any changes in schedule three (3) day(s) before the scheduled completion date arrange to do an interim inspection with the Departmental Representative.

25. SERVICE INTERRUPTIONS

.1 Arrange for all service interruptions with the Departmental Representative. Do not operate any NRC equipment or plant.

.2 Allow 72 hours notice prior to cutting into any existing service.

.3 All service interruptions are to be of minimum duration.

.4 Protect existing services as required and immediately make repairs if damage occurs.

.5 Provide detours, bridges, alternate feeds, etc., as required to minimize disruptions.

.6 Plan and perform work in advance in order to minimize disruption and service interruption.

26. SHOP DRAWINGS

.1 Submit to Departmental Representative for review, shop drawings, product data and samples specified within two (2) week(s) after contract award.

.2 Submit to Departmental Representative for review a complete list of all shop drawings, product data and samples specified and written confirmation of corresponding delivery dates within one (1) week after shop drawings, product data and samples approval date. This list shall be updated on a weekly basis and any changes to the list shall be immediately notified in writing to the Departmental Representative.

.3 Review shop drawings, data sheets and samples prior to submission.

.4 Submit 5 copies of all shop drawings and product data and samples for review, unless otherwise specified.

.5 Review of shop drawings and product data by the Departmental Representative does not relieve the contractor of the responsibility for errors and omissions and for the conformity with contract documents.

27. SAMPLES AND MOCK-UPS

.1 Submit samples in sizes and quantities specified.

.2 Where colour, pattern or texture is criterion, submit full range of samples.

.3 Construct field samples and mock-ups at locations acceptable to Departmental Representative.

.4 Reviewed samples or mock-ups will become standards of workmanship and material against which installed work will be checked on project.

28. MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.2 Notify the Departmental Representative in writing of any conflict between these specifications and manufacturer's instruction. Departmental Representative will designate which document is to be followed.

29. SPECIFICATIONS, "AS BUILTS"

.1 The contractor shall keep on the site, one (1) up-to-date copy of all specifications, drawings and bulletins pertaining to the work, in good order, available to the Departmental Representative and to his representatives at all times.

.2 At least one (1) copy of such specifications and drawings shall be marked by the contractor to show all work "As Built" and shall be handed over to the Departmental Representative with the Application for Payment and for the Final Certificate of Completion.

30. ACCEPTANCE OF SITE

.1 Inspect the site before commencing work, review any unexpected conditions with the Departmental Representative.

.2 Commencement of work will imply acceptance of existing conditions.

31. PARTIAL OCCUPANCY

.1 NRC may request partial occupancy of the facility if the contract extends beyond the expected completion date.

32. USE OF SITE

.1 Restrict operations on site to the areas approved by the Departmental Representative at the time of tendering.

.2 Locate all temporary structures, equipment, storage, etc., to the designated areas.

.3 Restrict parking to the designated areas.

.4 Do not restrict access to the building, routes, and services.

.5 Do not encumber the site with materials or equipment.

33. SITE ACCESS

.1 Make prior arrangements with the Departmental Representative before starting work or moving materials and equipment on site.

.2 Obtain approval of Departmental Representative for regular means of access during the construction period.

.3 Obtain approval of Departmental Representative before temporarily suspending operations on site; before returning to the site and before leaving the site at the end of the job.

.4 Provide and maintain access to site.

.5 Build and maintain temporary roads and provide snow removal during period of work.

.6 Make good any damage and clean up dirt, debris, etc., resulting from contractor's use of existing roads.

34. OVERLOADING

.1 Ensure that no part of the building or work is subjected to a load which will endanger safety or cause permanent deformation or structural damage.

35. TEMPORARY SERVICES

.1 A source of temporary power will be made available in the area. Bear all costs to make connections to the power source and perform distribution on site.

.2 Provide all load centres, breakers, conduit, wiring, disconnects, extension cords, transformers, as required from the source of power.

.3 Power is to be used only for power tools, lighting, controls, motors, and not for space eating.

.4 A source of temporary water will be made available if required.

.5 Bear all costs associated with distributing the water to the required locations.

.6 Comply with NRC requirements when connecting to existing systems in accordance with the articles entitled "Co-operation" and "Service Interruptions" of this section.

36. SITE OFFICE & TELEPHONE

.1 Contractor to erect a temporary site office at his own expense.

.2 Install and maintain a telephone, if necessary.

.3 Use of NRC phones not permitted unless in the case of an emergency.

37. SANITARY FACILITIES

.1 Obtain permission from the Departmental Representative to use the existing washroom facilities in the building.

.2 Provide sanitary facility, and bear all associated costs.

38. PROJECT MEETINGS

.1 Hold regular project meetings at times and locations approved by the Departmental Representative.

.2 Notify all parties concerned of meetings to ensure proper coordination of work.

.3 Departmental Representative will set times for project meetings and assume responsibility for recording and distributing minutes.

39. STORAGE

.1 Provide storage as required to protect all tools, materials, etc., from damage or theft and be responsible for the same.

.2 Do not store flammable or explosive materials on site without the authorization of the NRC Fire Prevention Officer.

40. DRAINAGE

.1 Provide temporary drainage and pumping as required to keep excavations and site free of water.

41. ENCLOSURE OF STRUCTURES

.1 Construct and maintain all temporary enclosures as required to protect foundations, sub-soil, concrete, masonry, etc., from frost penetration or damage.

.2 Maintain in place until all chances of damage are over and proper curing has taken place.

.3 Provide temporary weathertight enclosures for exterior openings until permanent sash and glazing and exterior doors are installed.

.4 Provide lockable enclosures as required to maintain the security of NRC facilities and be responsible for the same.

.5 Provide keys to NRC security personnel when required.

42. LAYOUT OF WORK

.1 Lay out the work carefully and accurately.

.2 Verify all dimensions and be responsible for them.

.3 Locate and preserve general reference points.

.4 Employ competent person to lay out work in accordance with control lines and grades provided by the Departmental Representative.

43. CONCEALING

.1 Conceal all services, piping, wiring, ductwork, etc., in floors, walls or ceilings except where indicated otherwise.

44. SPACE CONFLICT

.1 Maintain an awareness of responsibility to avoid space conflict with other trades.

.2 Throughout the course of construction, keep continuously acquainted with field conditions, and the work being developed by all trades involved in the project.

45. CUTTING AND PATCHING

.1 Cut existing surfaces as required to accommodate new work.

.2 Remove all items as shown or specified.

.3 Patch and make good with identical materials, the surfaces that have been disturbed, cut or damaged, to the Departmental Representative's satisfaction.

.4 Where new pipes pass through existing construction, core drill an opening. Size openings to leave 12mm (1/2") clearance around the pipes or pipe insulation. Do not drill or cut any surface without the approval of the Departmental Representative.

.5 Obtain written approval of the Departmental Representative before cutting openings through existing or new structural members.

.6 Seal all openings where cables, conduits or pipes pass through walls with an acoustic sealant conforming to CAN/CGSB-19.21-M87.

.7 Where cables, conduits and pipes pass through fire rated walls and floors, pack space between with compressed glass fibres and seal with caulking in accordance with CAN/CGSB-19.13-M87 AND NBC 3.1.7.

46. CLEAN-UP DURING CONSTRUCTION

.1 On a daily basis, maintain project site and adjacent area of campus including roofs, free from debris and waste materials.

.2 Provide on-site dump containers for collection of waste materials and rubbish.

47. FINAL CLEAN-UP

.1 Upon completion do a final clean-up to the satisfaction of the Departmental Representative.

.2 Clean all new surfaces, lights, existing surfaces affected by this work, replace filters, etc.

.3 Clean all resilient flooring and prepare to receive protective finish. Protective finish applied by NRC

48. DISPOSAL OF WASTES

.1 Dispose of waste materials including volatiles, safely off NRC property. Refer to the article entitled "Fire & General Safety" of this section.

49. WARRANTY

.1 Refer to General Conditions "C", section GC32.

.2 Ensure that all manufacturers' guarantees and warranties are issued in the name of the Contractor and the National Research Council.

50. MAINTENANCE MANUALS

.1 Provide three (3) bilingual copies of maintenance manuals or two English and two French maintenance manuals immediately upon completion of the work and prior to release of holdbacks.

.2 Manuals to be neatly bound in hard cover loose leaf binders.

.3 Manuals to include operating and maintenance instructions, all guarantees and warranties, shop drawings, technical data, etc., for the material and apparatus supplied under this contract.

51. IDENTIFICATION BADGES

.1 Use of Identification Badges is mandatory in NRC buildings.

.2 Obtain all badges from the Security office.

52. SPECIFIED ACCEPTABLE & ALTERNATIVE EQUIPMENT & MATERIALS

.1 Materials and equipment scheduled and/or specified on the drawings or in the specifications have been selected to establish a performance and quality standard. In most cases, acceptable manufacturers are stated for any material or equipment specified by manufacturer's name and model number. Contractors may base their tender price on materials and equipment supplied by any of the manufacturers' names as acceptable for the particular material or equipment.

.2 In addition to the manufacturers specified or named as acceptable, you may propose alternative manufacturers of materials or equipment to the Departmental Representative for acceptance. For a product to be considered as an alternative product substitute, make a written application to the Departmental Representative during the tender period, not later than seven (7) working days before tender closing.

.3 Certify in writing that the alternative meets all requirements of the specified material or equipment. In addition, it shall be understood that all costs required by or as a result of acceptance or proposed alternatives, will be borne by the contractor.

.4 Approval of alternatives will be signified by issue of an Addendum to the Tender Documents.

.5 Any alternative manufacturers or materials submitted which are incomplete and cannot be evaluated, or are later than seven (7) working days before tender closing date or after the tender period, will not be considered.

53. DRAWINGS

.1 The following drawings illustrate the work and form part of this contract: 3903-E01, 3903-E02, 3903-G01 and 3903-S01

END OF SECTION

Part 1 General

1.1 AUTHORITIES

.1 The Fire Commissioner of Canada (F.C.) is the authority for fire safety at NRC.

.2 For the purpose of this document, "Departmental Representative" will be deemed as the NRC person in charge of the project.

.3 The Departmental Representative will consult with the Fire Prevention Officer (FPO) as and when required.

.4 The Departmental Representative will enforce these Fire Safety Requirements.

.5 Comply with the following standards as published by the Office of the Fire Commissioner of Canada:

.1 Standard No. 301 - June 1982 "Standard for Construction Operations";

.2 Standard No. 302 - June 1982 "Standard for Welding and Cutting".

1.2 Hot Work

.1 Permit:

.1 Prior to commencement of any "Hot Work" involving welding, soldering, burning, heating, use of torches or salamanders or any open flame, obtain a Hot Work Permit from the Departmental Representative.

.2 Site Review:

.1 Prior to commencement of "Hot Work", review the area of hot work with the Departmental Representative to determine the level of fire safety precautions to be taken.

1.3 REPORTING FIRES

.1 Know the exact location of the nearest Fire Alarm Pull Station and telephone, including the emergency phone number.

.2 REPORT immediately, all fire incidents as follows

.1 Activate nearest fire alarm pull station and;

.2 Telephone the following emergency phone number:

NRC LOCATION	NON-NRC PHONES	CELLULAR OR NRC PHONES
Montreal Road Campus	**613-993-2411**	**333**
Uplands	**613-993-2411**	**333**
Carleton Place	**613-993-2411 OR**	**993-2411**
Greenbank	**613-993-2411 OR**	**993-2411**
Sussex Drive	**613-993-2411**	**333**

.3 When reporting a fire by phone, give the location of fire, building number and be prepared to verify location.

.4 The person activating fire alarm pull station must remain at the scene of fire to provide information and direction to the Fire Department personnel.

1.4 INTERIOR AND EXTERIOR FIRE PROTECTION & ALARM SYSTEMS

.1 DO NOT OBSTRUCT OR SHUT OFF FIRE PROTECTION EQUIPMENT OR ALARM SYSTEMS WITHOUT AUTHORIZATION FROM THE DEPARTMENTAL REPRESENTATIVE.

.2 WHEN ANY FIRE PROTECTION EQUIPMENT IS TEMPORARILY SHUT DOWN, ALTERNATIVE MEASURES AS PRESCRIBED BY THE DEPARTMENTAL REPRESENTATIVE SHALL BE TAKEN TO ENSURE THAT FIRE PROTECTION IS MAINTAINED.

.3 DO NOT LEAVE FIRE PROTECTION OR ALARM SYSTEMS INACTIVE AT THE END OF A WORKING DAY WITHOUT NOTIFICATION AND AUTHORISATION FROM THE DEPARTMENTAL REPRESENTATIVE. THE DEPARTMENTAL REPRESENTATIVE WILL ADVISE THE (FPO) OF THE DETAILS OF ANY SUCH EVENT.

.4 DO NOT USE FIRE HYDRANTS, STANDPIPES AND HOSE SYSTEMS FOR OTHER THAN FIRE FIGHTING PURPOSES UNLESS AUTHORISED BY DEPARTMENTAL REPRESENTATIVE.

1.5 FIRE EXTINGUISHERS

.1 Provide a minimum of 1-20 lb. ABC Dry Chemical Fire Extinguisher for every hot work operation.

.2 Provide fire extinguishers for hot asphalt and roofing operations as follows:

.1 Pot area - 1-20 lb. ABC Dry Chemical;

.2 Roof - 2-20 lb. ABC Dry Chemical.

.3 Provide fire extinguishers equipped as below:

.1 Pinned and sealed;

.2 With a pressure gauge;

.3 With an extinguisher tag signed by a fire extinguisher servicing company.

.4 Carbon Dioxide (C02) extinguishers will not be considered as substitutes for the above.

1.6 ROOFING

.1 Kettles:

.1 Arrange for the safe location of asphalt kettles and material storage with the Departmental Representative before moving them on site. Do not locate kettles on

any roof or structure and keep them at least 10m away from a building and at a safe distance from parked automobiles.

.2 Equip kettles with thermometers or gauges that are in good working order.

.3 Do not operate kettles at temperatures in excess of 232^{o}C.

.4 Maintain continuous supervision while kettles are in operation and provide metal covers for the kettles to smother any flames in case of fire. Provide fire extinguishers as required in article 12.

.5 Advise the Departmental Representative of container capacities prior to start of work.

.6 Keep compressed gas cylinders secured in an upright position and a minimum of 20 feet away from any kettle.

.2 Mops:

.1 Use only glass fibre roofing mops.

.2 Remove used mops from the roof site at the end of each working day.

.3 Torch Applied Systems:

.1 Do not use torches next to walls.

.2 Provide a fire watch as required by article 13 of this section.

.4 Materials Storage:

.1 Store all combustible roofing materials at least 3m away from any structure and 6m from any kettle.

1.7 FIRE WATCH

.1 Provide a fire watch for a minimum of one hour after the termination of a hot work operation.

.2 Temporary heating, refer to General Instructions Section 01000.

.3 Equip fire watch personnel with fire extinguishers as required by article 5.

1.8 OBSTRUCT OF ACCESS/EGRESS ROUTES-ROADWAYS, HALLS, DOORS OR ELEVATORS

.1 Advise the Departmental Representative in advance of any work that would impede the response of the Fire Department personnel and their apparatus. This includes violation of minimum overhead clearance, erecting of barricades and the digging of trenches.

.2 Building exit routes must not be obstructed in any way without special permission from the Departmental Representative, who will ensure that adequate alternative routes are maintained.

.3 The Departmental Representative will advise the FPO of any obstruction that may warrant advanced planning and communication to ensure the safety of building occupants and the effectiveness of the Fire Department.

1.9 SMOKING

.1 Smoking is prohibited inside all NRC buildings.

.2 Obey all "NO SMOKING" signs.

1.10 RUBBISH AND WASTE MATERIALS

.1 Keep rubbish and waste materials to a minimum and a minimum of 20 feet from any kettle or torches.

.2 Do not burn rubbish on site.

.3 Removal:

.1 Remove all rubbish from work site at the end of the work day or shift, or as directed.

.4 Storage:

.1 Exercise extreme care when storing combustible waste materials in work areas. Ensure maximum possible cleanliness, ventilation and that all safety standards are adhered to when storing any combustible materials.

.2 Deposit greasy or oily rags or materials subject to spontaneous combustion in CSA or ULC approved receptacles and remove as required in 10.3.1.

.5 Dumpsters:

.1 Consult the Departmental Representative to determine an acceptable safe location before bringing the dumpster on site.

1.11 FLAMMABLE LIQUIDS

.1 The handling, storage and use of flammable liquids are governed by the current National Fire Code of Canada.

.2 Flammable Liquids such as gasoline, kerosene and naphtha may be kept for ready use in quantities not exceeding 45 litres, provided they are stored in approved safety cans bearing the ULC seal of approval. Storage of quantities of flammable liquids exceeding 45 litres for work purposes, require the permission of the Departmental Representative.

.3 Transfer of flammable liquids is prohibited within buildings.

.4 Do not transfer flammable liquids in the vicinity of open flames or any type of heat producing device.

.5 Do not use flammable liquids having a flash point below 38 ^{o}C such as naphtha or gasoline as solvents or cleaning agents.

.6 Store flammable waste liquids for disposal in approved container located in a safe, ventilated area. Waste flammable liquids are to be removed from the site on a regular basis.

.7 Where flammable liquids, such as lacquers or urethane are used, assure proper ventilation and eliminate all sources of ignition. Inform the Departmental Representative prior to, and at the cessation of such work.

1.12 QUESTIONS AND/OR CLARIFICATION

.1 Direct any questions or clarification on Fire Safety, in addition to the above requirements, to the Departmental Representative.

END OF SECTION

Part 1 General

1.1 SUBMITTALS

.1 Submittals: in accordance with Section 00 10 00 – General Instructions.

.2 Shop drawings to show:

- .1 Mounting arrangements.
- .2 Operating and maintenance clearances.

.3 Shop drawings and product data accompanied by:

- .1 Detailed drawings of bases, supports, and anchor bolts.
- .2 Acoustical sound power data, where applicable.
- .3 Points of operation on performance curves.
- .4 Manufacturer to certify current model production.
- .5 Certification of compliance to applicable codes.

.4 Closeout Submittals:

- .1 Provide operation and maintenance data for incorporation into manual specified in Section 00 10 00 – General Instructions.
- .2 Operation and maintenance manual approved by, and final copies deposited with, Departmental Representative before final inspection.
- .3 Operation data to include:
  - .1 Control schematics for systems including environmental controls.
  - .2 Description of systems and their controls.
  - .3 Description of operation of systems at various loads together with reset schedules and seasonal variances.
  - .4 Operation instruction for systems and component.
  - .5 Description of actions to be taken in event of equipment failure.
  - .6 Valves schedule and flow diagram.
  - .7 Colour coding chart.
- .4 Maintenance data to include:
  - .1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.
  - .2 Data to include schedules of tasks, frequency, tools required and task time.
- .5 Performance data to include:
  - .1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.
  - .2 Equipment performance verification test results.
  - .3 Special performance data as specified.
  - .4 Testing, adjusting and balancing reports as specified in Section 23 05 93 - Testing, Adjusting and Balancing for HVAC.
- .6 Approvals:

.1 Submit 2 copies of draft Operation and Maintenance Manual to Departmental Representative for approval. Submission of individual data will not be accepted unless directed by Departmental Representative.

.2 Make changes as required and re-submit as directed by Departmental Representative.

.7 Additional data:

.1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.

.8 Site records:

.1 Departmental Representative will provide 1 set of reproducible mechanical drawings. Provide sets of white prints as required for each phase of work. Mark changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.

.2 Transfer information weekly to reproducibles, revising reproducibles to show work as actually installed.

.3 Use different colour waterproof ink for each service.

.4 Make available for reference purposes and inspection.

.9 As-built drawings:

.1 Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.

.2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).

.3 Submit to Departmental Representative for approval and make corrections as directed.

.4 Perform testing, adjusting and balancing for HVAC using as-built drawings.

.5 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

.10 Submit copies of as-built drawings for inclusion in final TAB report.

1.2 DEFINITIONS

.1 For purposes of this the Mechanical Division the following:

.1 "Concealed" - mechanical services and equipment in suspended ceilings and in chases and furred spaces.

.2 "Exposed" - will mean not concealed as defined above.

1.3 EXAMINATION OF THE SITE

.1 Carefully examine conditions at the site which the site will or may affect your work, and become familiar with both the new and existing construction, finishes, and other work associated with your work in order that your tender price includes for everything necessary for completion of your work within the proposed project schedule

1.4 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 00 10 00 – General Instructions.

.2 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 00 10 00 – General Instructions and 00 15 45 – General Safety Section and Fire Instructions.

1.5 MAINTENANCE

.1 Furnish spare parts in accordance with Section 00 10 00 – General Instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Waste Management and Disposal:

.1 Construction/Demolition Waste Management and Disposal: in accordance with Section 00 10 00 – General Instructions and Section 00 15 45 – General Safety Section and Fire Instructions.

1.7 COORDINATION & COOPERATION WITH OTHER TRADES

.1 Co-ordinate your work with the work of all trades to ensure a proper and complete installation. Notify all trades concerned of the requirement for openings, sleeves, inserts and other hardware necessary in their work for the installation of your work.

.2 The exact locations and routing of mechanical and electrical services must be properly planned, coordinated and established with all affected trades prior to installation such that they will clear each other as well as any obstructions. Generally, piping requiring uniform pitch shall be given the right of way, with other services located and arranged to suit.

1.8 PERMITS, CERTIFICATES & FEES

.1 Display all required permits on worksite and include copies of inspection certificates in operating and maintenance instruction manuals.

.2 Obtain "Hot Work Permit" from the Engineer prior to commencement of soldering, welding or other high temperature work.

.3 Comply with all requirements of Section 00 10 00 – General Instructions.

1.9 FEDERAL HALOCARBON REGULATION

.1 Generate halocarbon records for work on equipment (cooling equipment with CFC's, HCFC's and HFC refrigerants; fire suppression systems; solvent cleaning systems)that may result in the release of a halocarbon.

.2 Tag equipment with duplicate of halocarbon record.

.3 Provide additional copy of halocarbon record to NRC for inclusion in the Zone Halocarbon Service File.

1.10 CLEANING & FINAL ADJUSTMENT

.1 During construction, keep the site reasonably clear of rubbish and waste material resulting from your work on a daily basis to the satisfaction of the Engineer. Notify the general contractor of any requirements for a waste receptacle for disposal of waste materials.

.2 Clean interior and exterior of all systems including strainers, and vacuum interior of air handling units.

.3 Clean and refurbish all equipment and leave in first class operating condition including replacement of all filters in all air and piping systems.

.4 Balance and adjust all systems and each piece of equipment to operate as designed.

1.11 PROTECTION OF EQUIPMENT & MATERIALS

.1 Properly protect all of your equipment and materials on site from damage due to the elements, your work and the work of other trades, to the approval of the Engineer.

.2 Wherever possible, coordinate equipment deliveries with the manufacturers and/or suppliers such that equipment is delivered to the site when it is required, or so that it can be suitably stored within the building and protected from the elements.

1.12 STORAGE OF EQUIPMENT & MATERIALS

.1 Arrange for sufficient storage facilities off the premises for the storage of equipment and materials which will not be allowed to stand in the open, nor to interfere with normal operations in the building.

.2 Bring prefabricated materials on the job site as and when required to be installed.

1.13 HOISTING & SCAFFOLDING

.1 Provide all necessary hoists and scaffolds required for your work.

.2 Design and construction of scaffolding to be in accordance with CSA S269.2

Part 2 Products

2.1 MATERIALS

.1 Materials and products in accordance with Section 00 10 00 – General Instructions.

Part 3 Execution

3.1 PAINTING REPAIRS AND RESTORATION

.1 Do painting in accordance with section 09 91 23 - Interior Painting.

.2 Prime and touch up marred finished paintwork to match original.

.3 Restore to new condition, finishes which have been damaged.

3.2 CLEANING

.1 Clean interior and exterior of all systems including strainers. Vacuum interior of ductwork and air handling units.

3.3 FIELD QUALITY CONTROL

.1 Site Tests: conduct following tests in accordance with Section 00 10 00 – General Instructions and submit report as described in PART 1 - SUBMITTALS.

.2 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - SUBMITTALS.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

3.4 DEMONSTRATION (If Required)

.1 Departmental Representative will use equipment and systems for test purposes prior to acceptance. Supply labour, material, and instruments required for testing.

.2 Trial usage to apply to following equipment and systems:

.1 Fume hood and associated services.

.3 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.

.4 Use operation and maintenance manual, as-built drawings, and audio visual aids as part of instruction materials.

.5 Instruction duration time requirements as specified in appropriate sections.

.6 Determination of whether or not demonstration is required will be decided by Departmental Representative in consultation with end user (client).

3.5 PROTECTION

.1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED

.1 Section 00 10 00 – General Instructions
.2 Section 00 15 45 – General Safety Section and Fire Instructions
.3 Section 21 05 01 – Common Work Results- Mechanical

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB).
  .1 CAN/CGSB-1.60-[M89], Interior Alkyd Gloss Enamel.
  .2 CAN/CGSB-24.3-[92], Identification of Piping Systems.
.2 Canadian Gas Association (CGA).
  .1 CAN/CGA B149.1-[M95].
  .2 CAN/CGA B149.2-[M91].

.3 National Fire Protection Association
  .1 NFPA 13-1989, Installation of Sprinkler Systems.
  .2 NFPA 14-1986, Standpipe and Systems.

1.3 PRODUCT DATA

.1 Submit product data in accordance with Section 00 10 00 – General Instructions.
.3 Product data to include paint colour chips, all other products specified in this section.

1.4 SAMPLES

.1 Submit samples in accordance with Section 00 10 00 – General Instructions.
.2 Samples to include nameplates, labels, tags, lists of proposed legends.

PART 2 - PRODUCTS

2.1 MANUFACTURER'S EQUIPMENT NAMEPLATES

.1 Metal or plastic laminate nameplate mechanically fastened to each piece of equipment by manufacturer.
.2 Lettering and numbers to be raised or recessed.
.3 Information to include, as appropriate:
  .1 Equipment: Manufacturer's name, model, size, serial number, capacity.
  .2 Motor: voltage, Hz, phase, power factor, duty, frame size.

2.2 SYSTEM NAMEPLATES

.1 Colours:
  .1 Hazardous: red letters, white background.
  .2 Elsewhere: black letters, white background (except where required otherwise by applicable codes).
.2 Construction:
  .1 3 mm thick white anodized aluminum, matte finish, with square corners, letters accurately aligned and machine engraved into core.

.3 Sizes:

.1 Conform to following table:

Size # mm	Sizes (mm)	No. of Lines	Height of Letters
1	10 x 50	1	3
2	13 x 75	1	5
3	13 x 75	2	3
4	20 x 100	1	8
5	20 x 100	2	5
6	20 x 200	1	8
7	25 x 125	1	12
8	25 x 125	2	8
9	35 x 200	1	20

.2 Use maximum of 25 letters/numbers per line.

.4 Locations:

.1 Terminal cabinets, control panels: Use size #[5].

.2 Equipment in Mechanical Rooms: Use size #[9].

2.3 EXISTING IDENTIFICATION SYSTEMS

.1 Apply existing identification system to new work.

.2 Where existing identification system does not cover for new work, use identification system specified this section.

.3 Before starting work, obtain written approval of identification system from NRC representative.

2.4 PIPING SYSTEMS GOVERNED BY CODES

.1 Identification:

.1 Natural gas: To CAN/CGA B149.1

2.5 IDENTIFICATION OF PIPING SYSTEMS

.1 Identify contents by background colour, marking, pictogram (as necessary), legend; direction of flow by arrows. To CAN/CGSB 24.3 except where specified otherwise.

.2 Pictograms:

.1 Where required, to Workplace Hazardous Materials Information System (WHMIS) regulations.

.3 Legend:

.1 Block capitals to sizes and colours listed in CAN/CGSB-24.3.

.4 Arrows showing direction of flow:

.1 Outside diameter of pipe or insulation less than 75 mm: 100 mm long x 50 mm high.

.2 Outside diameter of pipe or insulation 75 mm and greater: 150 mm long x 50 mm high.

.3 Use double-headed arrows where flow is reversible.

.5 Extent of background colour marking:

.1 To full circumference of pipe or insulation.

.2 Length to accommodate pictogram, full length of legend and arrows.

.6 Materials for background colour marking, legend, arrows:

.1 Pipes and tubing 20 mm and smaller: Waterproof and heat-resistant pressure sensitive plastic marker tags.

.2 All other pipes: Pressure sensitive [plastic-coated cloth] [vinyl] with protective overcoating, waterproof contact adhesive undercoating, suitable for ambient of 100% RH and continuous operating temperature of 150øC and intermittent temperature of 200øC.

.7 Colours and Legends:

.1 Where not listed, obtain direction from Departmental Representative.

.2 Colours for legends, arrows: To following table:

Background colour: Yellow	Legend, arrows: BLACK
Green	WHITE
Red	WHITE

.3 Background colour marking and legends for piping systems:

Contents	Background Colour	Legend
Natural gas		to Codes
Propane		to Codes
Gas regulator vents		to Codes

2.6 IDENTIFICATION DUCTWORK SYSTEMS

.1 50 mm high stencilled letters and directional arrows 150 mm long x 50 mm high.

.2 Colours: Black, or co-ordinated with base colour to ensure strong contrast.

2.7 VALVES, CONTROLLERS

.1 Brass tags with 12 mm stamped identification data filled with black paint.

.2 Include flow diagrams for each system, of approved size, showing charts and schedules with identification of each tagged item, valve type, service, function, normal position, location of tagged item.

2.8 CONTROLS COMPONENTS IDENTIFICATION

.1 Identify all systems, equipment, components, controls, sensors with system nameplates as specified in section 25 05 54 – EMCS Identification.

2.9 LANGUAGE

.1 Identification to be in English.

PART 3 - EXECUTION

3.1 TIMING

.1 Provide identification only after all painting has been completed.

3.2 INSTALLATION

.1 Perform work in accordance with CAN/CGSB-24.3 except as specified otherwise.

.2 Provide ULC or CSA registration plates as required by respective agency.

3.3 NAMEPLATES

.1 Locations:

.1 In conspicuous location to facilitate easy reading and identification from operating floor.

.2 Standoffs:

.1 Provide for nameplates on hot and/or insulated surfaces.

.3 Protection

.1 Do not paint, insulate or cover in any way.

3.4 LOCATION OF IDENTIFICATION ON PIPING AND DUCTWORK SYSTEMS

.1 On long straight runs in open areas in boiler rooms, equipment rooms, galleries, tunnels: At not more than 17 m intervals and more frequently if required to ensure that at least one is visible from any one viewpoint in operating areas and walking aisles.

.2 Adjacent to each change in direction.

.3 At least once in each small room through which piping or ductwork passes.

.4 On both sides of visual obstruction or where run is difficult to follow.

.5 On both sides of separations such as walls, floors, partitions.

.6 Where system is installed in pipe chases, ceiling spaces, galleries, other confined spaces, at entry and exit points, and at each access opening.

.7 At beginning and end points of each run and at each piece of equipment in run.

.8 At point immediately upstream of major manually operated or automatically controlled valves, dampers, etc. Where this is not possible, place identification as close as possible, preferably on upstream side.

.9 Identification to be easily and accurately readable from usual operating areas and from access points.

.1 Position of identification to be approximately at right angles to most convenient line of sight, considering operating positions, lighting conditions, risk of physical damage or injury and reduced visibility over time due to dust and dirt.

3.5 VALVES, CONTROLLERS

.1 Valves and operating controllers, except at plumbing fixtures, radiation, or where in plain sight of equipment they serve: Secure tags with non-ferrous chains or closed "S" hooks.

.2 Install one copy of flow diagrams, valve schedules mounted in frame behind non-glare glass where directed by NRC representative. Provide one copy (reduced in size if required) in each operating and maintenance manual.

.3 Number valves in each system consecutively.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTSSPEC

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

1.4 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

.1 The contractor is responsibility to coordinate and dispose of all waste material to local provincial and municipality requirements.

.2 It is the full responsibility of the contractor to insure that all construction material, equipment, tools, etc. are stored and used in a safe and reasonable manor as per good industry standards.

.3 The contractor is responsible for all damaged and stolen material, tools or equipment on site.

.4 The contractor is responsible for the delivery of all material, tools or equipment.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 CONNECTIONS TO EQUIPMENT

.1 In accordance with manufacturer's instructions unless otherwise indicated.

.2 Use valves and either unions or flanges for isolation and ease of maintenance and assembly.

.3 Use double swing joints when equipment mounted on vibration isolation and when piping subject to movement and when penetrating ceiling/roof and has indicated..

3.3 CLEARANCES

.1 Provide clearance around systems, equipment and components for observation of operation, inspection, testing (x-ray, servicing, maintenance and as recommended by manufacturer.

.2 Provide space for disassembly, removal of equipment and components as recommended by manufacturer or as indicated (whichever is greater) without interrupting operation of other system, equipment, components.

3.4 DIELECTRIC COUPLINGS

.1 General: compatible with system, to suit pressure rating of system.

.2 Locations: where dissimilar metals are joined.

.3 NPS 2 and under: isolating unions or bronze valves.

.4 Over NPS 2: isolating flanges.

3.5 PIPEWORK INSTALLATION

.1 Screwed fittings jointed with Teflon tape.

.2 Protect openings against entry of foreign material.

.3 Install to isolate equipment and allow removal without interrupting operation of other equipment or systems.

.4 Assemble piping using fittings manufactured to ANSI standards.

.5 Saddle type branch fittings may be used on mains if branch line is no larger than half size of main.

.1 Hole saw (or drill) and ream main to maintain full inside diameter of branch line prior to welding saddle.

.6 Install exposed piping, equipment, rectangular cleanouts and similar items parallel or perpendicular to building lines.

.7 Install concealed pipework to minimize furring space, maximize headroom, conserve space.

.8 Slope piping, except where indicated, in direction of flow for positive drainage and venting.

.9 Install, except where indicated, to permit separate thermal insulation of each pipe.

.10 Group piping wherever possible.

.11 Ream pipes, remove scale and other foreign material before assembly.

.12 Use eccentric reducers at pipe size changes to ensure positive drainage and venting.

.13 Provide for thermal expansion as indicated.

.14 Valves:

.1 Install in accessible locations.
.2 Remove interior parts before soldering.
.3 Install with stems above horizontal position unless otherwise indicated.
.4 Valves accessible for maintenance without removing adjacent piping.
.5 Install globe valves in bypass around control valves.
.6 Use valves at branch take-offs for isolating purposes except where otherwise specified.
.7 Install butterfly valves between weld neck flanges to ensure full compression of liner.
.8 Install ball valves for glycol service and where indicated.
.9 Use chain operators on valves NPS 2 1/2 and larger where installed more than 2400 mm above floor in Mechanical Rooms.

.15 Check Valves:

.1 Install silent check valves on discharge of pumps in vertical pipes with downward flow and elsewhere as indicated.
.2 Install swing check valves in horizontal lines on discharge of pumps and elsewhere as indicated.

3.6 SLEEVES

.1 General: install where pipes pass through masonry, concrete structures, fire rated assemblies, and elsewhere as indicated.

.2 Material: schedule 40 black steel pipe.

.3 Construction: foundation walls and where sleeves extend above finished floors to have annular fins continuously welded on at mid-point.

.4 Sizes: 6 mm minimum clearance between sleeve and uninsulated pipe or between sleeve and insulation.

.5 Installation:

.1 Concrete, masonry walls, concrete floors on grade: terminate flush with finished surface.
.2 Other floors: terminate 25 mm above finished floor.

.3 Before installation, paint exposed exterior surfaces with heavy application of zinc-rich paint to CAN/CGSB-1.181.

.6 Sealing:

.1 Foundation walls and below grade floors: fire retardant, waterproof non-hardening mastic.

.2 Elsewhere: Provide space for firestopping. Maintain fire rating integrity.

.3 Sleeves installed for future use: fill with lime plaster or other easily removable filler.

.4 Ensure no contact between copper pipe or tube and sleeve.

3.7 ESCUTCHEONS

.1 Install on pipes passing through walls, partitions, floors, and ceilings in finished areas.

.2 Construction: one piece type with set screws. Chrome or nickel plated brass or type 302 stainless steel.

.3 Sizes: outside diameter to cover opening or sleeve. Inside diameter to fit around pipe or outside of insulation if so provided.

3.8 FLUSHING OUT OF PIPING SYSTEMS

.1 Flush system in accordance with good industry standards and as indicated.

3.9 PRESSURE TESTING OF EQUIPMENT AND PIPEWORK

.1 Advise NRC with 48 hours minimum prior to performance of pressure tests.

.2 Pipework: test as specified in relevant sections.

.3 Maintain specified test pressure without loss for 4 hours minimum unless specified for longer period of time in relevant mechanical sections.

.4 Prior to tests, isolate equipment and other parts which are not designed to withstand test pressure or media.

.5 Conduct tests in presence of NRC and has indicated in relevant mechanical sections.

.6 Pay all costs for repairs or replacement, retesting, and making good. NRC to determine whether repair or replacement is appropriate.

.7 Insulate or conceal work only after approval and certification of tests and approved by NRC.

3.10 EXISTING SYSTEMS

.1 Connect into existing piping systems at times approved by NRC.

.2 Request written approval 10 days minimum, prior to commencement of work.

.3 Be responsible for damage to existing plant by this work.

.4 Ensure daily clean-up of existing areas.

3.11 CLEANING

.1 Clean in accordance with Section 00 10 00 – General Instructions.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 00 10 00 – General Instructions.

.2 Section 00 15 45 – General Safety Section and Fire Instructions.

.3 Section 21 05 01 – Common Work Results – Mechanical

.4 Section 23 05 05 – Installation of Pipework

1.2 REFERENCES

.1 American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME)

- .1 ANSI/ASME B31.1-2007, Power Piping.
- .2 ANSI/ASME B31.3-2006, Process Piping.
- .3 ANSI/ASME Boiler and Pressure Vessel Code-2007:
  - .1 BPVC 2007 Section I: Power Boilers.
  - .2 BPVC 2007 Section V: Nondestructive Examination.
  - .3 BPVC 2007 Section IX: Welding and Brazing Qualifications.

.2 American National Standards Institute/American Water Works Association (ANSI/AWWA)

- .1 ANSI/AWWA C206-03, Field Welding of Steel Water Pipe.

.3 American Welding Society (AWS)

- .1 AWS C1.1M/C1.1-2000(R2006), Recommended Practices for Resistance Welding.
- .2 AWS Z49.1-2005, Safety in Welding, Cutting and Allied Process.
- .3 AWS W1-2000, Welding Inspection Handbook..

.4 Canadian Standards Association (CSA International)

- .1 CSA W47.2-M1987(R2008), Certification of Companies for Fusion Welding of Aluminum.
- .2 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.
- .3 CSA B51-03(R2007), Boiler, Pressure Vessel and Pressure Piping Code.
- .4 CSA-W117.2-2006, Safety in Welding, Cutting and Allied Processes.
- .5 CSA W178.1-2008, Certification of Welding Inspection Organizations.
- .6 CSA W178.2-2008, Certification of Welding Inspectors.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide shop drawing of all welding material.

.2 Provide NRC with proposed welding procedure and all certificate approved by TSSA

1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Welders:

.1 Welding qualifications in accordance with CSA B51.

.2 Use qualified and licensed welders possessing certificate for each procedure performed from authority having jurisdiction.

.3 Submit welder's qualifications to NRC.

.4 Each welder to possess identification symbol issued by authority having jurisdiction.

.5 Certification of companies for fusion welding of aluminum in accordance with CSA W47.2.

.2 Inspectors:

.1 Inspectors qualified to CSA W178.2 or equivalent.

.3 Certifications:

.1 Registration of welding procedures in accordance with CSA B51.

.2 Copy of welding procedures available for inspection.

.3 Safety in welding, cutting and allied processes in accordance with CSA-W117.2.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

.1 The contractor is responsibility to coordinate and dispose of all waste material to local provincial and municipality requirements.

.2 It is the full responsibility of the contractor to insure that all construction material, equipment, tools, etc. are stored and used in a safe and reasonable manor as per good industry standards.

.3 The contractor is responsible for all damaged and stolen material, tools or equipment on site.

.4 The contractor is responsible for all delivery of material, tools or equipment.

Part 2 Products

2.1 ELECTRODES

.1 Electrodes: in accordance with CSA W48 Series.

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 QUALITY OF WORK

.1 Welding: in accordance with ANSI/ASME B31.1, B31.3, ANSI/ASME Boiler and Pressure Vessel Code, Sections I and IX and ANSI/AWWA C206, using procedures conforming to AWS B3.0, AWS C1.1, applicable requirements of provincial authority having jurisdiction].

.2 All welds shall be have clearly identified markings to indicate welder who completed weld. In the event that a weld is not clearly marked by welder, NRC has the right to reject the weld or require full gamma ray radiographic at contractor's expense.

3.3 INSTALLATION REQUIREMENTS

.1 Identify each weld with welder's identification symbol.

.2 Backing rings:

.1 Where used, fit to minimize gaps between ring and pipe bore.

.2 Do not install at orifice flanges.

.3 Fittings:

.1 NPS 2 and smaller: install welding type sockets unless otherwise indicated.

.2 Larger the NPS 2: butt welded fittings.

.3 Branch connections: install welding tees or forged branch outlet fittings.

3.4 INSPECTION AND TESTS - GENERAL REQUIREMENTS

.1 Review weld quality requirements and defect limits of applicable codes and standards with NRC before work is started.

.2 Formulate "Inspection and Test Plan" in co-operation with NRC.

.3 Do not conceal welds until they have been inspected, tested and approved by NRC.

.4 Provide for inspector to visually inspect welds during early stages of welding procedures in accordance with Welding Inspection Handbook. Repair or replace defects as required by codes and as specified.

3.5 SPECIALIST EXAMINATIONS AND TESTS

.1 General:

.1 Perform examinations and tests by specialist qualified to CSA W178.1 and CSA W178.2 and approved by NRC or TSSA

.2 To ANSI/ASME Boiler and Pressure Vessels Code, Section V, CSA B51 and requirements of authority having jurisdiction.

.3 Inspect and test of welds in accordance with "Inspection and Test Plan" by non-destructive visual examination, magnetic particle (hereinafter referred to as "particle") tests, spot/full gamma ray radiographic (hereinafter referred to as "radiography") tests as per specifications

.2 Hydrostatically test welds to ANSI/ASME B31.1 or B31.3 as specified.

.3 Visual examinations: include entire circumference of weld externally and wherever possible internally.

.4 Failure of visual examinations:

.1 Upon failure of welds by visual examination, perform additional testing as directed by NRC and/or TSSA, selected at random by NRC or TSSA by , radiographic and/or particle tests as directed by NRC.

.5 Full radiographic tests for compressed, steam, fuel, high pressure piping systems or as specified.

.1 Spot radiography:

.1 Conduct spot radiographic tests of up to 10% of welds, selected at random by NRC from welds which would be most difficult to repair in event of failure after system is operational.

.2 Radiographic film:

.1 Identify each radiographic film with date, location, name of welder, and submit to NRC. Replace film if rejected because of poor quality.

.3 Interpretation of radiographic films:

.1 By qualified radiographer.

.4 Failure of radiographic tests:

.1 Extend tests to welds by welder responsible when those welds fails tests.

.6 Magnetic particle tests for piping systems as per each piping specification and on drawing.

.7 In the event of a discrepancy between this section.

3.6 DEFECTS CAUSING REJECTION

.1 As described in ANSI/ASME B31.1/B31.3 and ANSI/ASME Boiler and Pressure Vessels Code.

.2 In addition, chilled water systems below 413 kPa (60 psig):

.1 Undercutting greater than 0.8 mm adjacent to cover bead on outside of pipe.

.2 Undercutting greater than 0.8 mm adjacent to root bead on inside of pipe.

.3 Undercutting greater than 0.8 mm at combination of internal surface and external surface.

.4 Incomplete penetration and incomplete fusion greater than total length of 38 mm in 1500 mm length of weld depth of such defects being greater than 0.8 mm.

.5 Repair cracks and defects in excess of 0.8 mm in depth.

.6 Repair defects whose depth cannot be determined accurately on basis of visual examination or radiographic particle tests.

.7 NRC has the right to reject any weld that cannot be reasonable proven to be acceptable.

3.7 REPAIR OF WELDS WHICH FAILED TESTS

.1 Re-inspect and re-test repaired or re-worked welds at Contractor's expense.

3.8 CLEANING

.1 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Materials and installation for piping, valves and fittings for gas fired equipment.

.2 Related Sections:

1.2 REFERENCES

.1 American Society of Mechanical Engineers (ASME)

.1 ASME B16.5, Pipe Flanges and Flanged Fittings.
.2 ASME B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.
.3 ASME B16.22, Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
.4 ASME B18.2.1, Square and Hex Bolts and Screws Inch Series.
.5 ASME B31.3 – Process piping.
.6 ASME B31.1 – Power piping.

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM A47/A47M, Standard Specification for Ferritic Malleable Iron Castings.
.2 ASTM A333/A333M, Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Services.
.3 ASTM A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.
.4 ASTM B75M, Standard Specification for Seamless Copper Tube [Metric].
.5 ASTM B837, Standard Specification for Seamless Copper Tube for Natural Gas and Liquefied Petroleum (LP) Gas Fuel Distribution Systems.

.3 Canadian Standards Association (CSA International)

.1 CSA W47.1, Certification of Companies for Fusion Welding of Steel.

.4 Canadian Standards Association (CSA)/Canadian Gas Association (CGA)

.1 CAN/CSA B149.1B, Natural Gas and Propane Installation Code Handbook.
.2 CAN/CSA B149.2-00, Propane Storage and Handling Code.

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

.1 Submittals in accordance with Section 00 10 00 – General Instructions.

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet for piping, fittings and equipment.
.2 Indicate on manufacturers catalogue literature following: valves.

.3 Test Reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties.

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

.5 Instructions: submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Pre-Installation Meeting:

.1 Convene pre-installation meeting one week prior to beginning work. All work and scheduling to be coordinated and approved by NRC.

.1 Verify project requirements.

.2 Review installation conditions.

.3 Co-ordination with other building sub-trades.

.4 Review installation instructions and warranty requirements.

.2 Health and Safety:

.1 Comply with all provincial construction occupational health and safety requirements and in accordance with Section 00 15 45 – General Safety Section and Fire Instructions.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

.1 The contractor is responsibility to coordinate and dispose of all waste material to local provincial and municipality requirements.

.2 It is the full responsibility of the contractor to insure that all construction material, equipment, tools, etc. are stored and used in a safe and reasonable manor as per good industry standards.

.3 The contractor is responsible for all damaged and stolen material, tools or equipment on site.

.4 The contractor is responsible for all delivery of material, tools or equipment

Part 2 Products

2.1 STEEL PIPE AND FITTINGS

.1 Steel piping connection:

.1 Piping Connections:

.1 Flanged: equipment connections

.2 Threaded: 1/2 to 2 NPT

.3 Welded: 1/2 to 8 NPT -

.2 -45 to 60 ^{O}C, up to 860 kPa (125 psig), Sch. 40 - welded, flanged, threaded

.1 ASTM seamless A106 Gr B or A53 Gr B , B149.1

.2 Malleable iron: screwed, banded, Class 150.

.3 Steel pipe flanges and flanged fittings: to ASME B16.5 – A105

.4 Welding: butt-welding fittings.

.5 Unions: malleable iron, brass to iron, ground seat, to ASTM A47/A47M.

.6 Bolts / nuts: to ASME B18.21-A193-B7

.7 Nipples: schedule 40, to ASTM A333.

.8 Thread: ASME 16.5/B16.11

.9 Flange Gaskets: B16.20 / B16.21

.10 Buried piping: c/w Yellow Jacket to 300 MM above finished grade (High Density Two Layer Polyethylene CSA Z245.21). All joints to be sealed with corrosion protection heat-shrinkable sleeve (Standard of Acceptance: Canusa-CPS, Product K-60)

2.2 ALTERNATE PIPING MATERIALS:

.1 Unless otherwise specified or approved by NRC alternate piping material shall not be accepted.

2.3 VALVES

.1 Provincial Code approved, lubricated ball type.

2.1 GASKETS

.1 Spiral wound inner and outer ring type.

.1 Maximum Temperature : 677 ^{o}C (1250 ^{o}F)

.2 Flange Class : 150 to 1500

.3 ASME B16.20

.4 Center Ring Material: 316ss inner ring

.5 Spiral Winding Material: 316ss graphite

.6 Inner Ring Material: 316ss inner ring

.2 Standard of Acceptance: Manufacturer: Garlock, Style: RWI

2.2 PAINTING

.1 All exposed exterior steel piping, piping flanges and fittings to be painted yellow.

.2 To be installed as per manufacturer recommendations.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 PIPING

.1 Install in accordance CAN/CSA B149.1.and here in. In the event of any differences between any codes or standard the most stringent shall apply.

.2 Install contractor shall hold a valid up to date G2 Certificate for all system below 400,000 BTUH and G1 Certificate for all system above 400,000 BTUH

.3 Install drip points:

.1 At low points in piping system.

.2 At connections to equipment.

.3 As indicated.

3.3 BRAZING PROCEDURES

.1 Bleed inert gas (nitrogen) into pipe during brazing.

.2 Valves are not to be brazed.

.3 Do not apply heat near expansion valve and bulb.

3.4 VALVES

.1 Install valves with stems upright or horizontal unless otherwise approved by NRC.

.2 Install valves at branch take-offs to isolate pieces of equipment, and as indicated.

3.5 ADJUSTING

.1 Purging: purge after pressure test in accordance with CAN/CSA B149.1.

.2 Pre-Start-Up Inspections:

.1 Check vents from regulators, control valves, terminate outside building in approved location, protected against blockage, damage.

.2 Check gas trains, entire installation is approved by authority having jurisdiction.

3.6 PRESSURE AND LEAK TESTING

.1 Site Tests/Inspection:

.1 Test system in accordance with CAN/CSA B149.1 and requirements TSSA.

.2 Close valves and other equipment not designed for test pressures.

.3 Certification and qualifications requirements:

.1 Certificate of authorization from Technical Standard and Safety Association of Ontario (TSSA) to undertake work on process piping B31.3.

2. Provide mill test report for all piping.

3. The contractor is responsible to organize and arrange for all license and welding procedure and welders qualification verification by TSSA inspector. This shall also include TSSA inspector visits for inspections and to witness testing and non-destructive examination and visit fees required by TSSA.

4. Contractor shall bare all costs associated with any modification necessary to meet the requirements of TSSA.

5. Contractor shall be responsible for provision of all labour and material necessary to blank off tested section, and remove items which cannot sustain test pressure. All pneumatic tests to be completed as per CAN/CSA B149.1.

6. In addition to pressure tests contractor shall provide NRC with an independent report detailing evaluation of radiography results for a minimal of 20% of randomly selected welds (by NRC or TSSA). Radiography report shall be completed by individual certified to CAN-CGSB-48.9712 and shall include radiography images.

6. NRC shall be given a minimum of 48 hour notice of all tests.

7. Contractor shall provide records of the tests, data on instrumentation used and calibration of gauges shall be made available to NRC.

8. All piping components provided must have a valid Canadian Registration Number (CRN) recognized by the TSSA. All CRN(s) to be supplied and approved by NRC prior to installation. Contractor shall coordinate with the TSSA inspector time of brazing. TSSA inspector shall be able to wittiness and inspected the brazed fitting and piping fit-up.

3.7 CLEANING

.1 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

1 REFERENCES

.1 Perform all work to meet or exceed the requirements of the Canadian Electrical Code, CSA Standard C22.1 - (latest edition).

.2 Consider CSA Electrical Bulletins in force at time of tender submission, while not identified and specified by number in this Division, to be forming part of related CSA Part II standard.

.3 Do overhead and underground systems in accordance with CSA C22.3 except where specified otherwise.

.4 Where requirements of this specification exceed those of above mentioned standards, this specification shall govern.

.5 Notify the NRC Departmental Representative as soon as possible when requested to connect equipment supplied by NRC which is not CSA approved.

.6 Refer to Sections 00 10 00 & 0015 45.

2 PERMITS AND FEES

.1 Submit to Electrical Inspection Department and Supply Authority necessary number of drawings and specifications for examination and approval prior to commencement of work.

.2 Pay all fees required for the performance of the work.

3 START-UP

.1 Instruct the NRC Departmental Representative and operating personnel in the operation, care and maintenance of equipment supplied under this contract.

4 INSPECTION AND FEES

.1 Furnish a Certificate of Acceptance from the Authorized Electrical Inspection Department on completion of work.

.2 Request and obtain Special Inspection approval from the Authorized Electrical Inspection Department for any non-CSA approved control panels or other equipment fabricated by the contractor as part of this contract.

.3 Pay all fees required for inspections.

5 FINISHES

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

.1 Outdoor electrical equipment "equipment green" finish to EEMAC Y1-1-1955.

.2 Indoor switchgear and distribution enclosures light grey to EEMAC 2Y-1-1958.

.2 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.

6 ACOUSTICAL PERFORMANCE

.1 In general provide equipment producing minimal sound levels in accordance with the best and latest practices established by the electrical industry.

.2 Do not install any device or equipment containing a magnetic flux path metallic core, such as gas discharge lamp ballasts, dimmers, solenoids, etc., which are found to produce a noise level exceeding that of comparable available equipment.

7 EQUIPMENT IDENTIFICATION

.1 Identify with 3mm (1/8") Brother, P-Touch non-smearing tape, or an alternate approved by the NRC Departmental Representative, all electrical outlets shown on drawings and/or mentioned in the specifications. These are the recessed and surface mounted receptacles such as those in offices and service rooms and used to plug in office equipment, telecommunication equipment or small portable tools. Indicate only the source of power (Ex. for a receptacle fed from panel L32 circuit #1: "L32-1").

.2 Light switches and light fixtures are the only exceptions for electrical equipment identification (except as noted in 7.13 below). They are not to be identified.

.3 Identify with lamicoid nameplates all electrical equipment shown on the drawings and/or mentioned in the specification such as motor control centers, switchgear, splitters, fused switches, isolation switches, motor starting switches, starters, panelboards, transformers, high voltage cables, industrial type receptacles, junction boxes, control panels, etc., regardless of whether or not the electrical equipment was furnished under this section of the specification.

.4 Coordinate names of equipment and systems with other Divisions to ensure that names and numbers match.

.5 Wording on lamicoid nameplates to be approved by the NRC Departmental Representative prior to fabrication.

.6 Provide two sets of lamicoid nameplates for each piece of equipment; one in English and one in French.

.7 Lamicoid nameplates shall identify the equipment, the voltage characteristics and the power source for the equipment. Example: A new 120/240 volt single phase circuit breaker panelboard, L16, is fed from panelboard LD1 circuit 10.

"PANEL L16
120/240 V
FED FROM LD1-10"

PANNEAU L16
120/240 V
ALIMENTE PAR LD1-10

.8 Provide warning labels for equipment fed from two or more sources - "DANGER MULTIPLE POWER FEED" black letters on a yellow background. These labels are available from NRC's Facilities Maintenance group in building M-19.

.9 Lamicoid nameplates shall be rigid lamicoid, minimum 1.5 mm (1/16") thick with:

.1 Black letters engraved on a white background for normal power circuits.

.2 Black letters engraved on a yellow background for emergency power circuits.

.3 White letters engraved on a red background for fire alarm equipment.

.10 For all interior lamicoid nameplates, mount nameplates using two-sided tape.

.11 For all exterior lamicoid nameplates, mount nameplates using self-tapping 2.3 mm (3/32") dia. slot head screws - two per nameplate for nameplates under 75 mm (3") in height and a minimum of 4 for larger nameplates. Holes in lamicoid nameplates to be 3.7 mm (3/16") diameter to allow for expansion of lamicoid due to exterior conditions.

.1 No drilling is to be done on live equipment.

.2 Metal filings from drilling are to be vacuumed from the enclosure interiors.

.12 All lamicoid nameplates shall have a minimum border of 3 mm (1/8"). Characters shall be 9 mm (3/8") in size unless otherwise specified.

.13 Identify lighting fixtures which are connected to emergency power with a label "EMERGENCY LIGHTING/ÉCLAIRAGE D'URGENCE", black letters on a yellow background. These labels are available from NRC's Facilities Maintenance group in building M-19.

.14 Provide neatly typed updated circuit directories in a plastic holder on the inside door of new panelboards.

.15 Carefully update panelboard circuit directories whenever adding, deleting, or modifying existing circuitry.

8 WIRING IDENTIFICATION

.1 Unless otherwise specified, identify wiring with permanent indelible identifying markings, using either numbered or coloured plastic tapes on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and colour coding throughout.

9 CONDUIT AND CABLE IDENTIFICATION

.1 Apply red paint to the covers of junction boxes and condulets of fire alarm conduits.

.2 Apply yellow paint to the covers of junction boxes and condulets of emergency power circuits.

.3 Apply blue paint to the covers of junction boxes and condulets of voice/data cables.

10 MANUFACTURER'S & APPROVALS LABELS

.1 Ensure that manufacturer's registration plates are properly affixed to all apparatus showing the size, name of equipment, serial number, and all information usually provided, including voltage, cycle, phase and the name and address of the manufacturer.

.2 Do not paint over registration plates or approval labels. Leave openings through insulation for viewing the plates. Contractor's or sub-contractor's nameplate not acceptable.

11 WARNING SIGNS AND PROTECTION

.1 Provide warning signs, as specified or to meet requirements of Authorized Electrical Inspection Department and NRC Departmental Representative.

.2 Accept the responsibility to protect those working on the project from any physical danger due to exposed live equipment such as panel mains, outlet wiring, etc. Shield and mark all live parts with the appropriate voltage. Caution notices shall be worded in both English and French.

12 LOAD BALANCE

.1 Measure phase current to new panelboards with normal loads operating at time of acceptance. Adjust branch circuit connections as required to obtain best balance of current between phases and record changes, and revise panelboard schedules.

.2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment.

13 MOTOR ROTATION

.1 For new motors, ensure that motor rotation matches the requirements of the driven equipment.

.2 For existing motors, check rotation before making wiring changes in order to ensure correct rotation upon completion of the job.

14 GROUNDING

.1 Thoroughly ground all electrical equipment, cabinets, metal supporting frames, ventilating ducts and other apparatus where grounding is required in accordance with the requirements of the latest edition of the Canadian Electrical Code Part 1, C.S.A. C22.1 and corresponding Provincial and Municipal regulations. Do not depend upon conduits to provide the ground circuits.

.2 Run separate green insulated stranded copper grounding conductors in all electrical conduits including those feeding toggle switches and receptacles.

15 TESTS

.1 Provide any materials, equipment and labour required and make such tests deemed necessary to show proper execution of this work, in the presence of the NRC Departmental Representative.

.2 Correct any defects or deficiencies discovered in the work in an approved manner at no additional expense to the Owner.

.3 Megger all branch circuits and feeders using a 600V tester for 240V circuits and a 1000V tester for 600V circuits. If the resistance to ground is less than permitted by Table 24 of the Code, consider such circuits defective and do not energize.

.4 The final approval of insulation between conductors and ground, and the efficiency of the grounding system is left to the discretion of the local Electrical Inspection Department.

16 COORDINATION OF PROTECTIVE DEVICES

.1 Ensure circuit protective devices such as overcurrent trips, fuses, are installed to values and settings as indicated on the Drawings.

17 WORK ON LIVE EQUIPMENT & PANELS

.1 NRC requires that work be performed on non-energized equipment, installation, conductors and power panels. For purposes of quotation assume that all work is to be done after normal working hours and that equipment, installation, conductors and power panels are to be de-energized when worked upon.

END OF SECTION

Part 1 General

1.1 RELATED WORK SPECIFIED ELSEWHERE

.1 Common Work Results - Electrical Section 26 05 00

1.2 MATERIALS

.1 Provide only new equipment and materials, without blemish or defect, bearing Canadian Standards Association or Authorized Electrical Inspection Department labels, and subject to the approval of the NRC Departmental Representative.

.2 After a contract is awarded, utilize alternative methods and/or materials only after receiving the NRC Departmental Representative's approval.

Part 2 Products

2.1 BUILDING WIRES AND GENERAL REQUIREMENTS

.1 Conductor material for branch circuit wiring and grounding:

- .1 Stranded copper.
- .2 Neutral wire: continuous throughout its length without breaks.
- .3 Separate insulated green grounding conductors in all electrical conduits.
- .4 All wire and cable insulation shall meet the C.S.A. Standards for the types and services hereinafter specified. Colours as per section 4-036 of Electrical Code.
- .5 Where otherwise specified, use wire and cable types as follows:
  - .1 Type R90 XLPE cross-link polyethylene stranded for applications using wires sized No. 8 and larger.
  - .2 Type TW stranded for applications using wires sized No. 10 and smaller.
  - .3 For fire alarm wiring refer to Section 283100.
  - .4 Approved heat resistant wire for wiring through and at lighting and heating fixtures. Where insulation types are shown on the drawings other types shall not be used unless the specification is more restrictive.
- .6 Use BX cable only under the following conditions:
  - .1 Wiring from a junction box to a recessed lighting fixture in suspended ceilings. Cable length not to exceed 1.5 m (5'), or
  - .2 Wiring or switches or 15 amp receptacles in partitions having removable wall panels, or
  - .3 When specifically called for on drawings.
- .7 Use stranded wire no smaller than No. 12 AWG for lighting and power and no smaller than No. 16 AWG for control wiring.
- .8 Conductors shall be soft copper properly refined and tinned having a minimum conductivity of 98%.

Part 3 Execution

3.1 BUILDING WIRES

.1 Install building wires as follows:

.1 Make joints, taps and splices in approved boxes with solderless connectors. Joints and/or splices are not acceptable inside a panelboard.

.2 Ensure the lugs accommodate all the strands of the conductor.

.3 Replace any wire or cable showing evidence of mechanical injury.

.4 Use No. 10 AWG for branch circuit wiring extending more than 30 m (100 ft.) to farthest outlet from panel.

.5 Circuit numbers indicated on the drawing are intended as a guide for the proper connection of multi-wire circuits at the panel.

.6 Take care to keep the conductors free from twisting.

.7 Use an approved lubricant for pulling in conduit.

.8 Leave sufficient slack on all runs to permit proper splicing and connection of electrical devices.

.9 Branch circuit wiring of 120 volt applications to be multi-wire utilizing common neutrals. Under no condition shall any switch break a neutral conductor.

.10 Provide and install an approved fire- retardant wrap or coating for PVC jacketed cables installed in a grouped configuration of two or more.

END OF SECTION

Part 1 General

1.1 RELATED WORK SPECIFIED ELSEWHERE

.1 Common Work Results - Electrical Section 26 05 00

1.2 MATERIALS

.1 Provide only new equipment and materials, without blemish or defect, bearing Canadian Standards Association or Authorized Electrical Inspection Department labels, and subject to the approval of the NRC Departmental Representative.

.2 After a contract is awarded, utilize alternative methods and/or materials only after receiving the NRC Departmental Representative's approval.

Part 2 Products

2.1 WIRE AND BOX CONNECTORS

.1 Pressure type wire connectors sized to fit conductors.

2.2 WIRING TERMINATIONS

.1 Provide first grade wire and cable connectors suitable for the service on which they are used and install them in accordance with the latest trade practice.

.2 Provide high quality extruded copper-free aluminium (0.4% or less) connectors for single and multi conductor cable. Steel and then zinc plated connectors for multi conductor cables.

.3 When used in hazardous area, connectors should be certified for such location in Class, Division and Group.

.4 For large conductor sizes, use bolted or compression solderless type connectors.

.5 Use high temperature connectors and insulation on all connections of high temperature conductors.

.6 Where connector types are called for on the drawings or in the specification, do not use other types.

.7 Lugs, terminals, screws used for termination of wiring to be suitable for copper conductors.

.8 For fire alarm wiring refer to Section 28 31 00.

Part 3 Execution

3.1 INSTALLATION

.1 Install stress cones, terminations, and splices in accordance with manufacturer's instructions.

.2 Bond and ground as required [to CSA C22.2No.41].

END OF SECTION

Part 1 General

1.1 RELATED WORK SPECIFIED ELSEWHERE

.1 Common Work Results - Electrical Section 26 05 00

1.2 MATERIALS

.1 Provide only new equipment and materials, without blemish or defect, bearing Canadian Standards Association or Authorized Electrical Inspection Department labels, and subject to the approval of the NRC Departmental Representative.

.2 After a contract is awarded, utilize alternative methods and/or materials only after receiving the NRC Departmental Representative's approval.

Part 2 Products

2.1 FITTINGS

.1 Fittings: manufactured for use with conduit specified. Coating: same as conduit.

.2 Fittings for liquid-tight flexible conduits shall be liquid-tight connectors.

.3 Provide expansion couplings for all conduits running in slabs through expansion joints. These shall be the type approved for use in concrete with a bonding conductor.

2.2 OUTLET BOXES

.1 Size boxes in accordance with CSA-C22.

.2 Unless otherwise specified, provide galvanized steel outlet boxes at least 40mm (1-1/2") deep, single or ganged style, of proper size to accommodate devices used and shall be equipped with covers as necessary of the type designed for the specified fittings. Pull boxes shall be steel and shall be galvanized or painted to prevent rusting. For lighting fixture outlets, use 100mm (4") octagon boxes.

.3 Equip with plaster rings for flush mounting devices in finished walls.

.4 Blank cover plates for boxes without wiring devices.

.5 Equip with centre fixture studs for light fixtures.

.6 Use cast boxes where indicated and for surface mounted wiring. In areas above hung ceilings where appearance is not significant, pressed steel surface boxes may be used.

.7 Supply all outlet boxes and pull boxes sized according to code requirements unless specified otherwise on the drawings.

2.3 SUPPORT HARDWARE

.1 Use 10mm (3/8") threaded rod for suspended unistrut and conduit.

.2 Unless otherwise specified, use 41mm x 41mm (1-5/8" x 1-5/8") galvanized steel unistrut for conduit support systems.

Part 3 Execution

3.1 INSTALLATION

.1 Install outlet boxes as follows:

.1 Support boxes independently of connecting conduits.

.2 Make necessary mounting adjustments to the outlet to match interior finish.

.3 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of construction material.

.4 Where more than one conduit enters a switch or receptacle box on the same side, provide a 100mm (4") minimum square box with a suitable plaster ring.

.5 Location and appearance to be to the NRC Departmental Representative's approval.

END OF SECTION

Part 1 General

1.1 RELATED WORK SPECIFIED ELSEWHERE

.1 Common Work Results - Electrical Section 26 05 00

1.2 MATERIALS

.1 Provide only new equipment and materials, without blemish or defect, bearing Canadian Standards Association or Authorized Electrical Inspection Department labels, and subject to the approval of the NRC Departmental Representative.

.2 After a contract is awarded, utilize alternative methods and/or materials only after receiving the NRC Departmental Representative's approval.

Part 2 Products

2.1 RACEWAYS

.1 Conduit:

.1 Each length of conduit to be new and bear the CSA Stamp of Approval.

.2 Conduit, unless otherwise noted, to be EMT, no smaller than 12mm (1/2").

.2 Bushings and Connectors:

.1 Insulated type, with the insulation an integral part of the fitting.

.3 Conduit Fastening:

.1 One hole malleable iron straps to secure surface conduits. Two hole straps for conduits larger than 50mm (2").

.2 Beam clamps to secure conduits to exposed steel work.

.3 Channel type supports for two or more conduits.

.4 Pull Cord:

.1 Polypropylene cord in empty conduit.

.5 Unless specifically called for on the drawings, do not use flexible conduits but it is recognized that there may be applications where this material will be useful, such as equipment connections, etc. In such cases, obtain permission for its use from the NRC Departmental Representative. For tender purposes, assume that flexible conduits will not be permitted unless specifically called for on the drawings or equipment specifications. All flexible conduits for vapour-tight applications shall be liquid-tight flexible conduits (seal-tight).

.6 Provide expansion couplings for all conduits running in slabs through expansion joints. These shall be the type approved for use in concrete with a bonding conductor.

2.2 SUPPORT HARDWARE

.1 Use 10mm (3/8") threaded rod for suspended unistrut and conduit.

.2 Unless otherwise specified, use 41mm x 41mm (1-5/8" x 1-5/8") galvanized steel unistrut for conduit support systems.

Part 3 Execution

3.1 RACEWAYS

.1 Install raceways as follows:

.1 Rigidly supported.

.2 Workmanlike manner.

.3 Maintain maximum headroom.

.4 Concealed in finished area.

.5 Surface-mounted in open area.

.6 Do not pass conduits through structural members except as indicated.

.7 Parallel to or at right angles to the building lines.

.8 Thoroughly ream all conduits at ends and terminate with appropriate locknuts and bushings.

.9 Cause minimum interference in spaces through which they pass.

.10 Plug or cap conduit during construction to protect from dust, dirt or water.

.11 Unless specifically indicated on drawings or with the permission of the NRC Departmental Representative, do not cast conduits in concrete.

.12 Dry conduits out before installing wire.

.13 Mechanically bend steel conduit larger than 22 mm (3/4") diameter. Bend conduit cold.

.14 Do not cut or modify prefabricated bends.

.15 PVC conduit as indicated.

.16 Function and appearance to be to the NRC Departmental Representative's approval.

.17 Seal conduit and cable openings in fire- rated walls and floors with an approved fire stop material.

.18 Seal conduit and cable openings in exterior walls with a weatherproof silicone sealant.

.19 Paint exposed conduits and boxes to match existing wall / ceiling.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Materials, components, cabinets, instruments and installation for metering and switchboard Instruments.

1.2 RELATED SECTIONS

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

1.3 REFERENCES

.1 American National Standards Institute (ANSI)

.1 ANSI C39.1-1981, Requirements, Electrical Analog Indicating Instruments.

.2 Canadian Standards Association, (CSA International)

.1 CAN3-C17-M84(R2004), Alternating - Current Electricity Metering.

1.4 PRODUCT DATA

.1 Submit product data in accordance with Section 00 10 00.

.2 Indicate meter, instrument, outline dimensions, panel drilling dimensions and include cutout template.

PART 2 - PRODUCTS

2.1 DIGITAL METER

.1 Power meter models must be available to directly accept voltage input over the range of 90 to 600 VAC (50 or 60Hz). Voltage inputs shall be fused or supplied from a dedicated 15A breaker from the distribution panel. Meter shall be powered directly from the voltage source.

.2 Measurements:

.1 Accumulated Real Energy (kWh) for each phase and total of all phases

.2 Accumulated Reactive Energy (kVARh) and Apparent Energy (kVAh) totals for all phases

.3 Net Present Demand and Peak demand for Real (kW), Reactive (kVAR) and Apparent (kVA) Power over a user-specified interval

.4 Instantaneous Real (kW), Reactive (kVAR) and Apparent Power (kVA), by phase and in total

.5 Power Factor, Current and Voltage for each phase and average of all phase pairs

.6 Phase-to-neutral voltage for each phase pair and average of all phases

.3 Communications:

.1 The power meter shall communicate all the above noted measurements using the Modbus RTU protocol.

.4 Standard of acceptance:

.1 Schneider Electric EM3550

2.2 ENCLOSURE

.1 PVC enclosure with hinged, clear shield.

.2 Specifically designed to house meter as specified.

.3 Standard of acceptance:

.1 Schneider Electric EM3500ENC

2.3 CURRENT TRANSDUCERS

.1 The power meter shall accept 0 to 0.333VAC secondary from CTs.

.2 One CT per phase conductor.

.3 Standard of acceptance:

.1 Schneider Electric Part number: U004-0012 - 50A CT with a 0.50”ID.

PART 3 - INSTALLATION

.1 Install meters and instrument transformers in enclosure.

.2 Mount Enclosure on wall as indicated on drawings.

.3 Ensure adequate spacing between current transformers installed on each phase.

.4 The contractor shall ensure proper operation of the meter including setup and configuration, programming CT ratios and voltage inputs. The contractor shall verify the meter is reading appropriately by comparing with a hand-held meter.

END OF SECTION

Part 1 General

1.1 SHOP DRAWINGS AND PRODUCT DATA

.1 Submit shop drawings and product data in accordance with Section 00 10 00.

.2 Submit stamped engineered drawings for structures supporting transformers on walls or other structures other than the floor.

.3 Prior to any installation of circuit breakers in either a new or existing installation, Contractor must submit three (3) copies of a certificate of origin, from the manufacturer, duly signed by the factory and the local manufacturer's representative, certifying that all circuit breakers come from this manufacturer, they are new and they meet standards and regulations. These certificates must be submitted to the Departmental Representative for approval.

- .1 The above applies to all breakers rated above 240V.
- .2 The above applied to all breakers rated up to 240V and 100A or more.

.4 A delay in the production of the certificate of origin won't justify any extension of the contract and additional compensation.

.5 Any work of manufacturing, assembly or installation should begin only after acceptance of the certificate of origin by Departmental Representative. Unless complying with this requirement, Departmental Representative reserves the right to mandate the manufacturer listed on circuit breakers to authenticate all new circuit breakers under the contract at the Contractor's expense.

.6 In general, the certificate of origin must contain:

- .1 The name and address of the manufacturer and the person responsible for authentication. The responsible person must sign and date the certificate;
- .2 The name and address of the licensed dealer and the person of the distributor responsible for the Contractor's account.
- .3 The name and address of the Contractor and the person responsible for the projet.
- .4 The name and address of the local manufacturer's representative. The local representative must sign and date the certificate.
- .5 The name and address of the building where circuit breakers will be installed:
  - .1 Project title.
  - .2 End user's reference number.
  - .3 The list of circuit breakers.

.7

1.2 IDENTIFICATION

.1 Identification as per Section 26 05 00.

Part 2 Products

2.1 DISCONNECT SWITCHES, FUSED AND NON-FUSED

.1 Fusible and non-fusible disconnect switches in EEMAC Enclosure as indicated.

.2 Provision for padlocking in "OFF" switch position.

.3 Mechanical voidable door interlock in "ON" position.

.4 Fuses: size and type as indicated.

.5 Fuseholders in each switch to be suitable without adaptors, for type and size of fuse indicated.

.6 Quick-make, quick-break action.

.7 "ON-OFF" switch position indication on switch enclosure cover.

.8 Standard of acceptance: Square D, Cutler-Hammer, Siemens.

2.2 GROUNDING

.1 Insulated grounding conductors in accordance with Section 26 05 00.

.2 Compression connectors for grounding to equipment provided with lugs.

2.3 BUCK AND BOOST TRANSFORMER

.1 Single phase, KVA rating, input and output voltage as indicated.

.2 Copper windings.

.3 EEMAC 1 enclosure, removable metal front and side panels.

.4 Drip shield.

.5 Standard of acceptance: Square D model 1.5S46F or approved equal.

2.4 DRY TYPE TRANSFORMER

.1 Type ANN, C802.2.

.2 Single or three phase, KVA rating, input and output voltage as indicated.

.3 Class 220, 150°C temperature rise insulation system.

.4 Copper windings.

.5 Four 2.5% taps, 2-FCAN and 2-FCBN.

.6 EEMAC 1 enclosure with lifting lugs, removable metal front and side panels.

.7 Drip shield.

.8 Standard of acceptance: Hammond or approved equal.

2.5 MOULDED CASE CIRCUIT BREAKER

.1 Thermal-magnetic moulded case circuit breakers, quick-make, quick-break type, for manual and automatic operation with temperature compensation for 40°C ambient.

.2 Common-trip breakers with single handle for multiple applications.

.3 All new 120V to 600V circuit breakers installed on this project are to include the handle accessory, "Handle Padlock Attachment", which locks breakers on or off.

.4 Magnetic instantaneous trip elements in circuit breakers, to operate only when the value of current reaches 10 times their setting.

.5 Circuit breaker and panel to be of same manufacturer.

.6 Circuit breakers minimum rating: 10K for 120/240V and 25K for 600/347V or greater if indicated.

.7 Standard of acceptance: Square D, Cutler-Hammer, Siemens.

2.6 FUSES

.1 250V and 600V time delay, rejection style, HRC-I, Class RK5.

.2 Standard of acceptance: Gould-Shawmut.

Part 3 Execution

3.1 DISCONNECT SWITCHES

.1 Install disconnect switches complete with fuses as indicated.

3.2 GROUNDING

.1 Install complete permanent, continuous, system and circuit, equipment, grounding systems including, conductors, compression connectors, accessories, as indicated, to conform to requirements of Engineer, and local authority having jurisdiction over installation. Where EMT is used, run ground wire in conduit.

.2 Install connectors in accordance with manufacturer's instructions.

.3 Protect exposed grounding conductors from mechanical injury.

.4 Soldered joints not permitted.

3.3 DRY TYPE TRANSFORMER

.1 Transformers above 75 kVA mount on floor.

.2 Provide adequate clearance around transformer for ventilation.

.3 Install transformers in level upright position.

.4 Remove shipping supports only after transformer is installed and just before putting into service.

.5 Loosen isolation pad bolts until no compression is visible.

.6 Make primary and secondary connections shown on wiring diagram.

.7 Energize transformers immediately after installation is completed, where practicable.

.8 Provide equipment identification in accordance with Section 26 05 00.

.9 Connect transformer through side of housing.

3.4 MOULDED CASE CIRCUIT BREAKERS

.1 Install circuit breakers as indicated.

3.5 FUSES

.1 Install fuses in mounting devices immediately before energizing circuit.

.2 Install fuses correctly sized to assigned electrical circuits.

.3 Provide 3 spare fuses for each rating supplied.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for steel lighting poles.

1.2 RELATED SECTIONS

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

Part 2 Products

2.1 LIGHTING POLE

.1 Steel pole. to CSA C22.2No.206 designed for underground wiring and:

.2 Square, steel shaft.

.3 Pole size: 7619mm tall, 100mm square, wall thickness 3mm.

.4 Flush mounted, internally reinforced hand hole.

.5 Ground lug.

.6 steel anchor bolts with 55,000 PSI yield strength, hot dipped galvanized coating, complete with hex nuts, flat, washers, and nut covers.

.7 Concrete base per drawing detail.

.8 Standard of acceptance: Hubbell SSS-25-40-1-TR-DB.

2.2 LUMINAIRE:

.1 347V, listed to UL1598 and CSA C22.2 #250.0-24, IP65.

.2 Die cast housing, one-piece gasket.

.3 150mm straight arm.

.4 dark bronze colour.

.5 90 LEDs, 227W, type 3 light distribution, 16973 Lumen output.

.6 Standard of acceptance: Spaulding Lighting CL1-AD-90L-F-4K-3-DB-RPA5-PR347 c/w PTL-6 photocontrol.

Part 3 Execution

3.1 INSTALLATION

.1 Install poles true and plumb, complete with brackets in accordance with manufacturer's instructions.

.2 Install luminaire on pole.

.3 Check luminaire orientation, level and tilt.

.4 Connect luminaire to lighting circuit.

.5 Make all final connections. Adjust orientation to get best result. Follow manufacturer’s installation instruction.

.6 Separate 347V wire and low voltage control wire in separate channels to avoid interference.

.7 Perform tests in accordance with Section 26 05 00 - Common Work Results - Electrical.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Outline of source, processing, and testing requirements for aggregates.

.2 Requirements for aggregates used as subbase, base and surface treatments.

.2 Related Sections:

.1 Section 31 00 99 – Earthwork for Minor Works.

.2 Section 31 23 33 – Excavation, Trenching and Backfilling.

.3 Section 32 11 23 – Aggregate Base Courses.

.4 Section 32 15 40 – Crushed Stone Paving.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D4791-99, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

.2 Ministry of Transportation, Ontario (MTO)

.1 Laboratory Testing Manual LS-602, Sieve Analysis of Aggregates.

.3 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 501 – Compaction.

.2 OPSS 1001 – Aggregates – General.

.3 OPSS 1006 – Aggregates – Surface Treatment.

.4 OPSS 1010 – Aggregates – Bases, Subsbase, Select Subgrade, and Backfill Material.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver and stockpile aggregates as per Section 31 23 33 – Excavation, Trenching and Backfilling and in accordance with OPSS 1001.

.2 Stockpile granular materials in manner to prevent segregation.

.3 Store cement in weathertight bins or silos that provide protection from dampness and easy access for inspection and identification of each shipment.

Part 2 Products

2.1 MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.

.2 Aggregate materials as per Section 32 11 23 – Aggregate Base Courses and in accordance with OPSS 1001, OPSS 1006, and OPSS 1010.

2.2 SOURCE QUALITY CONTROL

.1 Inform NRC representative of proposed source of aggregates and provide access for sampling at least four (4) weeks prior to commencing production.

.2 If, in opinion of NRC representative, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.3 Advise NRC representaive two (2) weeks in advance of proposed change of material source.

.4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

Part 3 Execution

3.1 PREPARATION

.1 Topsoil stripping

.1 Topsoil stripping to be conducted in accordance with Section 31 14 13 – Soil Stripping and Stockpiling.

.2 Aggregate source preparation

.1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as directed by Departmental Representative.

.2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.

.3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.

.4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.

.5 Trim off and dress slopes of waste material piles and leave site in neat condition.

.3 Processing

.1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.

.2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use approved methods and equipment.

.3 Wash aggregates, if required to meet specifications. Use only approved equipment.

.4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.

.4 Handling

.1 Handle and transport aggregates to avoid segregation, contamination and degradation.

.5 Stockpiling

.1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Departmental Representative. Do not stockpile on completed pavement surfaces.

.2 Stockpile aggregates in sufficient quantities to meet Project schedules.

.3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.

.4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.

.5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.

.6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by NRC Representative within 48 h of rejection.

.7 Stockpile materials in uniform layers of thickness as follows:

.1 Max 1.5 m for coarse aggregate and base course materials.

.2 Max 1.5 m for fine aggregate and sub-base materials.

.3 Max 1.5 m for other materials.

.8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.

.9 Do not cone piles or spill material over edges of piles.

.10 Do not use conveying stackers.

.11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEANING

.1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.

.2 Leave any unused aggregates in neat compact stockpiles as directed by Departmental Representative.

.3 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Requirements for the construction of untreated granular subbase, base, roadway surface and shoulder, edge ramping for pavement and stockpiling.

.2 Related Sections:

.1 Section 31 05 16 - Aggregate Materials.

.2 Section 31 23 33 – Excavation, Trenching and Backfilling.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C117-04, Standard Test Methods for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

.2 ASTM C131-03, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.3 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM D422-63(2002), Standard Test Method for Particle-Size Analysis of Soils.

.5 ASTM D1557-02e1, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700kN-m/m^3).

.6 ASTM D1883-99, Standard Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.7 ASTM D4318-00, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.2 Ministry of Transportation, Ontario (MTO)

.1 Laboratory Testing Manual LS-602, Sieve Analysis of Aggregates.

.3 Ontario Provincial Standard Specifications

.1 OPSS 501 – Compaction.

1.3 DELIVERY, STORAGE, AND HANDLING

.1 Deliver and stockpile aggregates as per Section 31 05 16 - Aggregate Materials, Section 31 23 33 – Excavation, Trenching and Backfilling and in accordance with OPSS 1001.

.2 Stockpile granular materials in manner to prevent segregation.

.3 Store cement in weathertight bins or silos that provide protection from dampness and easy access for inspection and identification of each shipment.

Part 2 Products

2.1 MATERIALS

.1 Granular 'B' Type II materials to Section 31 23 33 – Excavation, Trenching and Backfilling.

.2 Granular 'A' materials to Section 31 23 33 – Excavation, Trenching and Backfilling.

Part 3 Execution

3.1 SEQUENCE OF OPERATION

.1 Place granular sub-base after subgrade has been inspected and approved by NRC Representative.

.2 Place granular base after sub-base surface has been inspected and approved by NRC Representative.

3.2 PLACING

.1 Construct granular base and granular sub-base to depth and grade in areas indicated.

.2 Ensure no frozen material is placed.

.3 Place material only on clean unfrozen surface, free from snow and ice.

.4 Begin spreading material on crown line or on high side of one-way slope.

.5 Place material using methods which do not lead to segregation or degradation of aggregate.

.6 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.

.7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.8 Remove and replace that portion of layer in which material becomes segregated during spreading.

3.3 COMPACTION

.1 Compaction as per Section 31 23 33 – Excavation, Trenching and Backfilling and in accordance to OPSS 501.

.2 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.4 PROOF ROLLING

.1 For proof rolling use standard roller of 45400 kg gross mass with four pneumatic tires each carrying 11350 kg and inflated to 620 kPa. Four tires arranged abreast with centre to centre spacing of 730 mm.

.2 Obtain approval from NRC Representative to use non standard proof rolling equipment.

.3 Proof roll at level in granular base and sub-base as indicated. If use of non standard proof rolling equipment is approved, NRC Representative to determine level of proof rolling..

.4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.

.5 Where proof rolling reveals areas of defective subgrade:

.1 Remove base, sub-base and subgrade material to depth and extent as directed by NRC Representative.

.2 Backfill excavated subgrade with sub-base material and compact in accordance with this section.

.3 Replace sub-base material and compact in accordance with this section.

.4 Replace base material and compact in accordance with this section.

.6 Where proof rolling reveals defective base or sub-base, remove defective materials to depth and extent as directed by NRC Representative and replace with new materials in accordance with this section at no extra cost.

3.5 SITE TOLERANCES

.1 Finished base and sub-base surfaces to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.6 PROTECTION

.1 Maintain finished base and sub-base in condition conforming to this Section until succeeding material is applied or until acceptance by NRC Representative.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Requirements for aggregates used in surface treatment.

.2 Related Sections:

.1 Section 31 05 16 – Aggregate Materials.

.2 Section 31 23 33 – Excavation, Trenching and Backfilling.

.3 Section 32 11 23 – Aggregate Base Courses.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C 136-96a, Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM C 117-95, Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.3 ASTM E 11-95, Specification for Wire - Cloth Sieves for Testing Purposes.

.4 ASTM D 4318-98, Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.5 ASTM D 698-91, Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb. (2.49-kg) Rammer and 12-in (304.8-mm) Drop.

.2 Ministry of Transportation, Ontario (MTO)

.1 Laboratory Testing Manual LS-602, Sieve Analysis of Aggregates.

.3 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 1001 – Aggregates – General.

.2 OPSS 1860 – Geotextiles.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver and stockpile aggregates as per Section 31 05 16 – Aggregate Materials, Section 31 23 33 – Excavation, Trenching and Backfilling and in accordance with OPSS 1001.

.2 Stockpile granular materials in manner to prevent segregation.

Products

1.4 MATERIALS

.1 Granular topping:

.1 Screenings: hard, durable, crushed stone particles, free from clay lumps, cementation, organic material, frozen material and other deleterious materials.

.2 Gradations: within limits specified as per OPSS 1006.

.2 Geotextile filter: in accordance with OPSS 1860.

Part 2 Execution

2.1 SUBGRADE

.1 Ensure that subgrade preparation conforms to levels and compaction required to allow for installation of granular base.

2.2 GEOTEXTILE FILTER

.1 Install geotextile filter as indicated.

2.3 GRANULAR SUB-BASE

.1 Granular sub-base material minimum thickness: as indicated on Contract Drawings.

.2 Place in layer of 150 mm compacted thickness. Compact layer to 95% Standard Density in accordance with ASTM D 698.

2.4 GRANULAR BASE

.1 Granular base material minimum thickness: as indicated on Contract Drawings.

.2 Spread and compact granular base material in uniform layers not exceeding 150 mm compacted thickness.

.3 Compact to a density of not less than 100% Standard Density in accordance with ASTM D 698.

2.5 GRANULAR TOPPING

.1 Place granular topping to compacted thickness as indicated on Contract Drawings.

.2 Place in layer of 100 mm compacted thickness. Compact layer to 90% Standard Density in accordance with ASTM D 698.

2.6 FIELD QUALITY CONTROL

.1 Inspection and testing of crushed stone paving will be carried out by designated testing laboratory.

.2 Costs of tests will be paid by National Research Council.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Materials for installation and repair of chain link fences and gates.

.2 Related Sections:

.1 Not Applicable.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM A53/A53M-02, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A90/A90M-01, Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.

.3 ASTM A121-99, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.

.4 A653/A653M-03, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM C618-03, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-138.1-96, Fabric for Chain Link Fence.

.2 CAN/CGSB-138.2-96, Steel Framework for Chain Link Fence.

.3 CAN/CGSB-138.3-96, Installation of Chain Link Fence.

.4 CAN/CGSB-138.4-96, Gates for Chain Link Fence.

.5 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 541 – Chain-Link Fence.

.1 OPSS 541 shall apply except as amended or extended herein.

.1 Article 541.10 Basis of Payment shall be deleted, as all costs associated with the supply and installation of chain-link fencing shall be included in the lump sum project costs.

.2 OPSS 1541 – Chain-Link Fence Components.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Waste Management and Disposal:

.1 The contractor is responsibility to coordinate and dispose of all waste material to local provincial and municipality requirements.

.2 It is the full responsibility of the contractor to insure that all construction material, equipment, tools, etc. are stored and used in a safe and reasonable manor as per good industry standards.

.3 The contractor is responsible for all damaged and stolen material, tools or equipment on site.

.4 The contractor is responsible for the delivery of all material, tools or equipment.

Part 2 Products

2.1 MATERIALS

.1 Chain-link fence fabric, posts and rails, diagonal wire braces, top and bottom wires, gates, fittings and accessories, turnbuckles and barbed wires and associated accessories shall be in accordance with OPSS 1541.

.2 Concrete mixes and materials: in accordance with CAN/CSA-A23.1

- .1 Nominal coarse aggregate size: 20-5.
- .2 Compressive strength: 20 MPa minimum at 28 days
- .3 5 to 8 % air entrainment.
- .4 Additives: fly ash to CAN/CSA-A23.5.

.3 Chain-link fence fabric: to CAN/CGSB-138.1.

- .1 Type 1, Class A, #9 gauge steel wire woven in 50.8 mm mesh.
- .2 Height of fabric: 1.8 m.
- .3 Acceptable material : galvanized steel.

.4 Top rail and mid brace: 32 mm diameter schedule 40 galvanized steel to CAN/CGSB-138.2.

.5 Corner/End/Gate posts: 100 mm diameter schedule 40 galvanized steel to CAN/CGSB-138.2.

.6 Bottom tension wire: to CAN/CGSB-138.2, single strand, 6 gauge galvanized steel wire.

.7 Tie wire fasteners: to CAN/CGSB-138.2, single strand minimum 14 gauge aluminum alloy wire.

.8 Tension bar: to ASTM A653/A653M, 6 x 25 mm minimum galvanized steel.

.9 Gates: to CAN/CGSB-138.4. All gates shall be lockable.

.10 Gate frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 45 mm outside diameter pipe for outside frame, 35 mm outside diameter pipe for interior bracing.

.1 Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized after welding.

.2 Fasten fence fabric to gate with twisted selvage at top.

.3 Furnish gates with galvanized malleable iron hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate.

.4 Furnish double gates with chain hook to hold gates open and centre rest (300 mm x 300 mm x 150 mm deep concrete rest –flush with grade) with drop bolt for closed position.

.11 Fittings and hardware: to CAN/CGSB-138.2, galvanized steel.

.1 Tension bar bands: 3 x 20 mm minimum galvanized steel.

.2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.

.3 Overhang tops to provide waterproof fit, to hold top rails and an outward projection to hold barbed wire overhang.

.4 Provide projection with clips or recesses to hold 3 strands of barbed wire spaced 100 mm apart.

.5 Projection of approximately 300 mm long to project from fence at 45 degrees above horizontal.

.6 Turnbuckles to be drop forged.

.12 Organic zinc rich coating: to CAN/CGSB-1.181.

.13 Barbed wire: to CAN/CGSB-138.2, minimum 2 mm diameter galvanized steel wire to ASTM A121, 4 point barbs with 125 mm spacing, alternate spacing between 3 rolls.

.14 Grounding : Only required around electrical sub stations and has indicated. See Section 26 05 27 - Grounding – Primary.

.1 Grounding rod: minimum 16 mm diameter copperwell rod, 3 m long .

2.2 FINISHES

.1 Galvanizing:

.1 For chain link fabric: to CAN/CGSB-138.1 Grade 2.

.2 For pipe: 550 g/m^{2}minimum to ASTM A90.

.3 For barbed wire: to CAN/CGSB-138.2.

.4 For other fittings: to CAN/CSA-G164.

Part 3 Execution

3.1 GRADING

.1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.

.1 Provide clearance between bottom of fence and ground surface of 30 mm to 50 mm.

3.2 ERECTION OF FENCE

.1 Erect fence along lines as indicated on Contract Documents and to CAN/CGSB-138.3.

.2 Excavate post holes to dimensions indicated on Contract Documents.

.3 Space line posts maximum 3 m apart, measured parallel to ground surface.

.4 Space straining posts at equal intervals not to exceed 150 m if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade, is greater than 150 m.

.5 Install additional straining posts at sharp changes in grade and where directed by Departmental Representative.

.6 Install corner post where change in alignment exceeds 10 degrees.

.7 Install end posts at end of fence and at buildings.

.1 Install gate posts on both sides of gate openings.

.8 Place concrete in post holes then embed posts into concrete.

.1 Extend concrete 25 mm above ground level and slope to drain away from posts.

.2 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

.9 Do not install Chain-link fence fabric until concrete has cured minimum of 5 days.

.10 Install brace between end and gate posts and nearest line post, placed in centre of panel and parallel to ground surface.

.1 Install braces on both sides of corner and straining posts in similar manner.

.11 Install overhang tops and caps.

.12 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.

.13 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands. Wire to be located 25 mm above finished grade.

.14 Lay out Chain-link fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.

.1 Knuckled selvedge at bottom.

.2 Twisted selvedge at top.

.3 Base of fabric to be a maximum of 25 mm above finished grade.

.15 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals.

.1 Give tie wires minimum two twists.

.16 Install barbed wire strands and clip securely to lugs of each projection.

.17 Install grounding rods as indicated.

3.3 INSTALLATION OF GATES

.1 Install gates in locations as indicated on Contract Documents.

.2 Level ground between gate posts and set gate bottom approximately 40 mm above ground surface.

.3 Determine position of centre gate rest for double gate.

.1 Cast gate rest in concrete as directed.

.2 Dome concrete above ground level to shed water.

.4 Install gate stops where indicated.

3.4 TOUCH UP

.1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged areas.

.1 Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

3.5 CLEANING

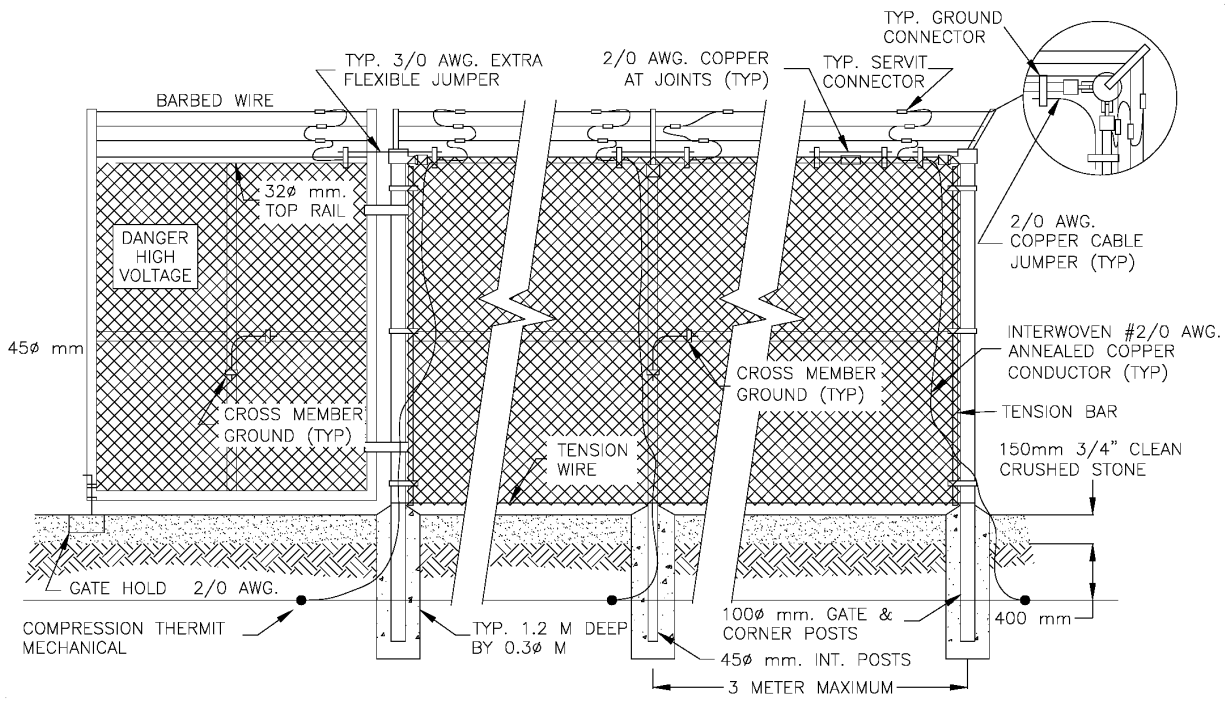
.1 Proceed in accordance with Section 00 10 00 – General Instructions.

.2 Clean and trim areas disturbed by operations.

.1 Dispose of surplus materials.

.2 Repair and re-instate any damaged items (ie. existing fencing, fence posts, grass, asphalt, etc.) to original or better condition that received damage as a result of fence installation.

3.6 SKETCH



END OF SECTION

Instruction Manual **IM0EV00001E**

Effective December 2013
Supercedes April 2012

DC Quick Charger Installation and Maintenance Manual

Note: Information and specifications subject to change. Production models may vary from renderings shown in this manual.

EATON
Powering Business Worldwide

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SAVE THESE INSTRUCTIONS

This manual contains important instructions for DC Quick Charger models that shall be followed during installation, operation and maintenance of the unit.

1. IMPORTANT SAFETY INSTRUCTIONS – PLEASE READ

⚠ WARNING ELECTRICAL

THIS EQUIPMENT SHOULD BE INSTALLED, ADJUSTED, AND SERVICED BY QUALIFIED ELECTRICAL PERSONNEL FAMILIAR WITH THE CONSTRUCTION AND OPERATION OF THIS TYPE OF EQUIPMENT AND THE HAZARDS INVOLVED. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN DEATH OR SEVERE INJURY

READ THIS MANUAL THOROUGHLY PRIOR TO INSTALLATION AND ENERGIZING THE EQUIPMENT. INSPECTION AND MAINTENANCE OF THIS EQUIPMENT SHOULD BE PERFORMED IN ACCORDANCE WITH THE OPERATING PROCEDURES DETAILED IN THIS MANUAL

THE PURPOSE OF THIS MANUAL IS TO PROVIDE YOU WITH INFORMATION NECESSARY TO SAFELY OPERATE, MAINTAIN, AND TROUBLESHOOT THIS EQUIPMENT. KEEP THIS MANUAL FOR FUTURE REFERENCE.

DO NOT USE THIS PRODUCT IF THE EV CABLE IS FRAYED, HAS DAMAGED INSULATION OR ANY OTHER SIGN OF DAMAGE.

DO NOT USE THIS PRODUCT IF THE ENCLOSURE OR THE EV CONNECTOR IS BROKEN, CRACKED, OPEN, OR SHOW ANY OTHER INDICATION OF DAMAGE.

INTENDED FOR USE WITH PLUG-IN ELECTRIC VEHICLES ONLY.

PREMISE VENTILATION NOT REQUIRED.

THE INFORMATION CONTAINED IN THIS MANUAL IS SUBJECT TO CHANGE WITHOUT NOTICE.

2. DEFINITIONS – SYMBOLS

⚠ WARNING ELECTRICAL

THIS SYMBOL INDICATES HIGH VOLTAGE. IT CALLS YOUR ATTENTION TO ITEMS OR OPERATIONS THAT COULD BE DANGEROUS TO YOU AND OTHER PERSONS OPERATING THIS EQUIPMENT. READ THE MESSAGE AND FOLLOW THE INSTRUCTIONS CAREFULLY.

⚠ WARNING

INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, CAN RESULT IN SERIOUS INJURY OR DEATH.

Note that even an item or procedure identified with "CAUTION" may, in some situations, lead to a serious injury. Every item or procedure is essential and should be followed.

⚠ CAUTION

INDICATES A POTENTIAL HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, CAN RESULT IN MINOR TO MODERATE INJURY, OR SERIOUS DAMAGE TO THE EQUIPMENT. THE SITUATION DESCRIBED IN THE CAUTION MAY, IF NOT AVOIDED, LEAD TO SERIOUS RESULTS. IMPORTANT SAFETY MEASURES ARE DESCRIBED IN CAUTION (AS WELL AS WARNING).

⚠ IMPORTANT

INDICATES A PARTICULAR ITEM OR INSTRUCTION THIS IS IMPORTANT TO CONSIDER.

ATTENTION

INDICATES AN ACTION OR OPERATION TO INSURE USER SAFETY.

PROHIBITED

INDICATES AN ACTION OR PROCEDURE THAT IS NOT ALLOWED.

3. LIST OF DANGERS AND CAUTIONS

[Installation]

⚠ CAUTION

- **USE UNDER ENVIRONMENTS SPECIFIED IN THE SPECIFICATION.**
- **THIS DEVICE CAN BE USED OUTDOORS, BUT SHALL NOT BE INSTALLED ON SITES UNDER ENVIRONMENTS OTHER THAN SPECIFIED IN THE SPECIFICATION OR WHERE POISONOUS GAS MAY BE GENERATED.**
- **CONFIRM THAT YOUR INSTALLATION SITE HAS A LOAD CAPACITY SUFFICIENT TO SUPPORT THIS DEVICE.**
- **DO NOT TOUCH VARIABLE RESISTORS ON THE CONTROLLER PRINTED CIRCUIT BOARD. THEY HAVE BEEN ADJUSTED OPTIMALLY THROUGH FACTORY TESTS.**
- **REMOVE DUSTS AND METAL FINES THAT BECOME ATTACHED DURING INSTALLATION WORK.**
- **DO NOT BLOCK EITHER OF THE INTAKE AND EXHAUST PORTS. BLOCKING THE INTAKE OR EXHAUST PORT MAY CAUSE AN INCREASE IN THE INTERNAL TEMPERATURE OF THE DEVICE AND RESULT IN FAILURE.**

ATTENTION

CHECK FOR LOOSENING OF FASTENED ASSEMBLIES AND DETACHABLE PARTS AFTER UNPACKAGING.

[Distribution Work and Maintenance]

⚠ DANGER

THERE IS A DANGER OF ELECTRIC SHOCK, INJURY, AND/OR BURNING

- **PERSONS SKILLED IN ELECTRIC SERVICES AND/OR RELATED REGULATIONS (PROFESSIONAL ENGINEERS OR TECHNICIANS) SHALL INSTALL ELECTRICAL WIRING AND PERFORM MAINTENANCE CHECKS.**
- **DO NOT PERFORM LIVE-WIRE OPERATIONS. DO NOT FORGET TO SHUT OFF THE POWER SUPPLY.**
- **THIS DEVICE INCLUDES CAPACITIVE COMPONENTS SUCH AS ELECTROLYTIC CAPACITORS. PROFESSIONAL ELECTRICIANS SHALL PERFORM SUCH OPERATIONS WITH CAREFUL ATTENTION TO CHARGED PARTS AFTER DISCHARGING THE ELECTROLYTIC CAPACITORS.**

⚠ DANGER

THERE IS A DANGER OF ELECTRIC SHOCK, INJURY, AND/OR BURNING.

- **THIS DEVICE MUST BE GROUNDED.**

⚠ DANGER

THERE IS A DANGER OF ELECTRIC SHOCK, INJURY, AND/OR BURNING.

- **PERSONS SKILLED IN ELECTRIC SERVICES AND/OR RELATED REGULATIONS (PROFESSIONAL ELECTRICIANS) SHALL PERFORM MAINTENANCE CHECKS.**
- **DO NOT TOUCH THE INSIDE OF THE DEVICE WHILE IT IS RUNNING.**
- **MAKE SURE NO VOLTAGE IS APPLIED WHEN YOU CHECK INSIDE THE DEVICE.**
- **DO NOT FORGET TO RETURN THE PROTECTIVE COVER TO ITS ORIGINAL STATE AFTER THE INSPECTION.**
- **THIS DEVICE INCLUDES CAPACITIVE COMPONENTS SUCH AS ELECTROLYTIC CAPACITORS. SO, SOME PARTS STILL REMAIN CHARGED INSIDE THE UNIT EVEN AFTER THE INPUT POWER SUPPLY IS DISCONNECTED. PROFESSIONAL ELECTRICIANS SHALL PERFORM SUCH MAINTENANCE CHECKS.**

⚠CAUTION

- **PERFORM PERIODIC INSPECTIONS AT RECOMMENDED INTERVALS. IF NOT INSPECTED, THE DEVICE MAY FAIL DUE TO COMPONENT DETERIORATION.**
- **PERIODICALLY REPLACE THE COMPONENTS WHICH ARE IDENTIFIED AS NEEDING PERIODIC REPLACEMENT. IF NOT REPLACED, THE DEVICE MAY FAIL DUE TO COMPONENT DETERIORATION.**

⚠CAUTION

THERE IS A DANGER OF ELECTRIC SHOCK, INJURY, BURNING, HEAT GENERATION, AND/OR FIRE.

- **DO NOT EXPOSE THE INTERIOR OF THIS DEVICE TO WATER OR MOISTURE. DO NOT USE THE DEVICE IF INTERIOR COMPONENTS ARE WET.**
- **DO NOT PUT ARTICLES INSIDE THE DEVICE THROUGH ANY OPENINGS**

⚠DANGER

THERE IS A DANGER OF ELECTRIC SHOCK, HEAT GENERATION, AND/OR FIRE.

- **DO NOT USE THE DEVICE WHEN SOMETHING IS WRONG WITH IT.**
- **TURN THE BREAKER OFF WHEN SOMETHING IS WRONG WITH THE DEVICE.**
  THEN PLEASE CONTACT A PERSON RESPONSIBLE FOR THE MAINTENANCE OF THE DEVICE OR YOUR VENDOR.

⚠DANGER

DANGER OF ELECTRIC SHOCK.

- **DO NOT FORGET TO WEAR INSULATING RUBBER GLOVES AND ELECTRICALLY RESISTIVE SHOES DURING MAINTENANCE OF THIS DEVICE. THERE IS A DANGER OF ELECTRIC SHOCK WITHOUT THEM.**

⚠DANGER

DANGER OF ELECTRIC SHOCK	**DO NOT FORGET TO SHUT DOWN AND LOCK-OUT THE DEVICE WHEN YOU ATTACH OR DETACH INSIDE AND/OR OUTSIDE COVERS PROTECTING ACTIVE PARTS.**
DANGER OF ELECTRIC SHOCK	**ATTACHING OR DETACHING THE COVERS PROTECTING ACTIVE PARTS WHILE THE DEVICE IS RUNNING MAY CAUSE AN ELECTRIC SHOCK ACCIDENT.** **DO NOT ALLOW THE COVERS PROTECTING ACTIVE PARTS TO COME IN CONTACT WITH CONDUCTIVE PARTS BECAUSE THERE REMAINS A CIRCUIT WITH VOLTAGE EVEN AFTER THE DEVICE IS SHUT DOWN.**
DANGER OF ELECTRIC SHOCK	**EVEN AFTER SHUTTING DOWN THE DEVICE, THE INTERNAL CIRCUITRY CONTINUES TO HOLD VOLTAGE UNTIL THE CAPACITORS ARE DISCHARGED. DIRECTLY TOUCHING THE CONDUCTIVE PARTS MAY CAUSE ELECTRIC SHOCK.**

⚠PROHIBITED

- **DO NOT DISCONNECT THE POWER FEED CONNECTOR DURING CHARGING.**
- **DO NOT TOUCH THE LEADING END PART OF THE POWER FEED CONNECTOR.**
- **DO NOT PUT FOREIGN ARTICLES IN THE LEADING END PART OF THE POWER FEED CONNECTOR.**

4. About Eaton's DC Quick Charger

Eaton's DC Quick Charger converts a 208VAC three phase voltage into DC voltage to directly charge an electric vehicle's lithium ion battery. The 50kW charger housing consists of 5 individual 10kW power drawers. This allows the charger to be scaled to a 20kW, 30kW, 40kW, or 50kW configuration. At each output level, the DC Quick Charger has N-1 capability which allows the charger to remain operational at a reduced output with the loss of one power drawer. In addition, the DC Quick electric vehicle charger utilizes a CHAdeMO compliant communications protocol and power connector.

Eaton's DC Quick Charger (DCQC) includes a Human-Machine Interface (HMI) which offers basic level data communications over Modbus RTU. It includes Ethernet with a Static IP address which allows access to the Usage and Fault Log.

It also includes a permissive run (PR) input, in the form of applying 24V which will either enable or disable the charger.

Modbus RTU is used for remote enable disable and status of the charger, including errors, power, state of charger , and power data. Ethernet is only used for programming and access to log files through ftp.

The DCQC can be optionally enhanced to include a magnetic swipe credit card reader, to be ChargePoint enabled, or its capabilities can be enabled by another third party connection over Modbus RTU or the Permissive Run.

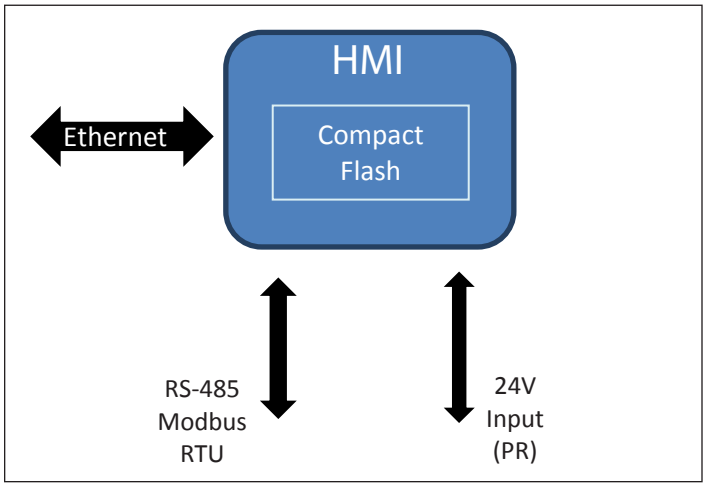


Figure 1. Human-Machine Interface (HMI) with Digital I/O for C*R*D1 configurations

Specifications

Table 1. DC Quick Charger Specifications.

	Item	Rating and Property	Remark
Type	Rating	A_0 Duty Cycle	100% continuous
	Cooling system	Forced air cooling	
	Insulating system	High-frequency transformer insulation	
	Output grounding system	DC ungrounded	
AC Input	Rated voltage	208VAC	
	Voltage fluctuation range	Within ±10%	
	Number of phases	Three-phase and three-line	
	Rated frequency	50 or 60Hz	
	Frequency fluctuation range	Within ±5%	
	Input power factor	0.95 or more	In rated operation
	Input power	60 kVA or less	In rated operation
	Input current	156A at any power configuration	
	Harmonic current	Total 5% or less Each 3% or less	
DC Output	Rated output capacity	20kW -50kW depending on configuration	5 lines of 10.0kW in parallel
	Rated voltage	400VDC	
	Voltage variable range	50 to 500 VDC	
	Max rated current	125 A	5 lines of 25A in parallel
	Current variable range	10 to 125 A	
	Voltage ripple	Within ±5% (±20 V)	At resistance load
	Current ripple	Within ±5% (±6.25 A)	At resistance load
	Voltage control accuracy	Within ±2% (±8 V)	

Table 2. Features

Feature	Basic	Credit Card Swipe	ChargePoint	Comments
Credit card swipe		X		Optional Feature. Allows for point of sale transaction ordered as Time-based or Session based. Requires third party setup/account with USA Technologies.
ChargePoint			X	Optional Feature. Allows for point of sale, tracking of usage data, advertising from ChargePoint Network. Requires service plan purchase.
Advertising	X	X	X	Setup from maintenance menu for Basic and Credit Card Swipe; setup from ChargePoint Network for ChargePoint enabled.
Pricing	X	X	X	Pricing for Basic and Credit card swipe can be displayed for its informational purposes only and can be set up from maintenance menu. For Credit Card Swipe option, the owner will also need to set up the price with USA Technologies. Pricing for ChargePoint enabled is set up from the Network and is the price that the customer will be charged and displayed. Requires proper service plan.
Curtailment	X	X	X	Available function through Modbus; for ChargePoint enabled this is performed through the Network. Requires proper service plan.
Logging	X	X	X	Log of usage data and Faults history.

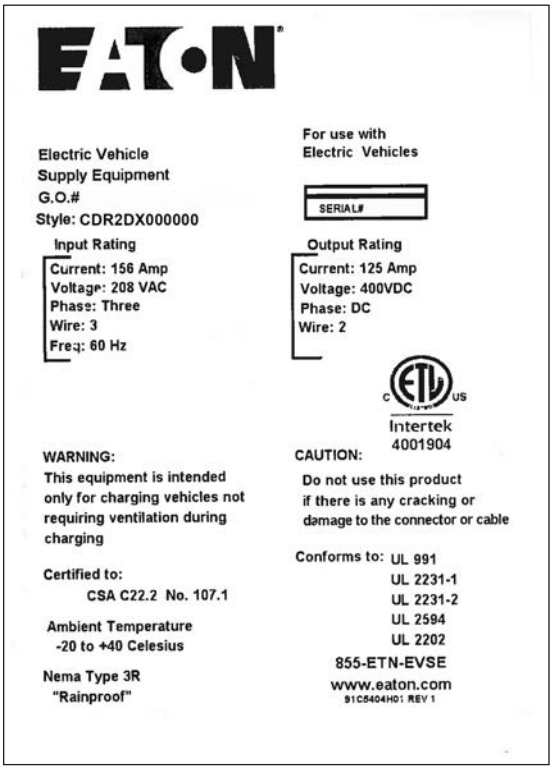


Figure 2. Name Plate Example

5. Moving, Transporting and Storage Instructions

Improper storage or handling may cause damage to the unit.

⚠ CAUTION

THERE IS A DANGER OF INJURY DUE TO DROPPING OR FALLING.

- **DO NOT FORGET TO FOLLOW SPECIFIED PROCEDURES FOR HOISTING OPERATIONS.**
- **TAKE MEASURES TO PREVENT FALLING WHEN YOU CARRY OR TRANSFER THE DEVICE.**

6. Before You Begin

⚠ WARNING ELECTRICAL

WARNING – ONLY QUALIFIED PERSONNEL FAMILIAR WITH THE OPERATION AND CONSTRUCTION OF THIS EQUIPMENT SHOULD INSTALL, ADJUST, MODIFY, AND SERVICE THIS EQUIPMENT. FAILURE TO FOLLOW THE INSTRUCTIONS COULD RESULT IN SEVERE BODILY INJURY OR DEATH.

⚠ IMPORTANT

THE USER IS RESPONSIBLE FOR CONFORMING TO ALL LOCAL AND NATIONAL ELECTRICAL CODES AND STANDARDS APPLICABLE IN THE JURISDICTION THIS EQUIPMENT IS INSTALLED IN TO.

6.1 ADA Standards for Accessible Design

It is very important to consider all STANDARDS FOR ACCESSIBLE DESIGN for Americans with Disabilities when choosing the location and placement of all Electric Vehicle Supply Equipment. The following is a direct excerpt from the 2010 ADA Standards for Accessible Design

(http://www.ada.gov/regs2010/2010ADAStandards/2010ADAstandards.htm#c3)

"The Department of Justice published revised regulations for Titles II and III of the Americans with Disabilities Act of 1990 "ADA" in the Federal Register on September 15, 2010. These regulations adopted revised, enforceable accessibility standards called the 2010 ADA Standards for Accessible Design "2010 Standards" or "Standards". The 2010 Standards set minimum requirements – both scoping and technical – for newly designed and constructed or altered State and local government facilities, public accommodations, and commercial facilities to be readily accessible to and usable by individuals with disabilities.

Adoption of the 2010 Standards also establishes a revised reference point for Title II entities that choose to make structural changes to existing facilities to meet their program accessibility requirements; and it establishes a similar reference for Title III entities undertaking readily achievable barrier removal.

The Department has assembled this online version of the official 2010 Standards to increase its ease of use. This version includes:

- 2010 Standards for State and Local Government Facilities Title II
- 2010 Standards for Public Accommodations and Commercial Facilities Title III

The Department has assembled into a separate publication the revised regulation guidance that applies to the Standards. The Department included guidance in its revised ADA regulations published on September 15, 2010. This guidance provides detailed information about the Department's adoption of the 2010 Standards including changes to the Standards, the reasoning behind those changes, and responses to public comments received on these topics. The document, Guidance on the 2010 ADA Standards for Accessible Design, can be downloaded from:

http://www.ada.gov

For information about the ADA, including the revised 2010 ADA regulations, please visit the Department's website www.ADA.gov; or, for answers to specific questions, call the toll-free ADA Information Line at 800- 514-0301 (Voice) or 800-514-0383 (TTY)."

6.2 Choosing a Location

⚠ IMPORTANT

Things to consider before choosing a location to install the unit:

1. 2010 Standards for Accessible Design.
2. Consultation with an Architect may be needed in order to conform with all governing standards for location and placement of Electric Vehicle Supply Equipment.
3. Location of an available electrical source – power wires must be run through an approved conduit or jacket from the circuit panel to the unit.
4. Location of the vehicle's charging inlet while parked – the unit must be located so its respective cable length is correctly sized to where the vehicle's inlet is accessible for plug-in without undue maneuvering.

Note: These installation location recommendations are based upon general purpose parking, trying to serve the most likely plug-in vehicle drivers. For specific parking, such as at home or in a captive fleet scenario where the user knows where the vehicle's inlet will be, locate the DC Quick Charger appropriately.

Each plug-in electric vehicle manufacturer has a different location for where the charging inlet is located on the vehicle.

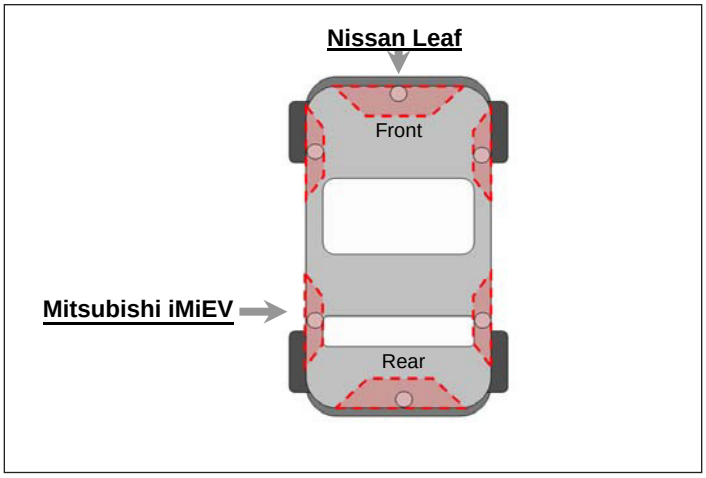


Figure 3. Vehicle Inlet Locations Differ by Manufacturer

6.3 Protecting the Location

For outdoor installations, creative use of protective bollards and wheel stops is necessary. Vehicles can and will damage the units if left unprotected. **See local jurisdiction requirements for actual specifications.**

6.4 Validating Cellular Signal

For DC Quick Charger configurations requiring cellular configurations, validate that the installation location has a signal strength of -85 dBm or better.

7. Installing the Electrical Service

7.1 Checking the Electrical Requirements

The DC Quick Charger's electric requirements and wiring installation procedure can be performed by any qualified electrician. The unit has overcurrent protection as required by the National Electric Code (NEC) and Canadian Electrical Code (CEC) and has an integrated UL listed 200 Amp breaker. Please see NEC Article 625 and CEC Part 1 Section 86 for installation requirements, and check in the installed jurisdiction for any other electrical requirements.

7.2 Running the wires

Once the proper electrical overcurrent device has been installed, wire needs to be run from it to the DC Quick Charger EVSE. For a typical installation, the only field wires will be for the incoming electrical service. If the EVSE unit has a remote management option, a standard CAT5/6 network cable could also need to be run to the unit.

The DC Quick Charger is a 3-phase, 3-wire system and requires one ground. Use Copper Conductors ONLY.

⚠ WARNING ELECTRICAL

WARNING – LOCKOUT/TAGOUT ALL ELECTRICAL SOURCE CIRCUITS FEEDING THE UNIT(S) IN THE OPEN POSITION BEFORE BEGINNING WIRING OR TERMINATIONS. FAILURE TO FOLLOW THE INSTRUCTIONS COULD RESULT IN SEVERE BODILY INJURY OR DEATH.

⚠ WARNING

THIS UNIT IS RATED FOR INDOOR OR OUTDOOR INSTALLATION. IF THIS UNIT IS MOUNTED OUTDOORS, THE HARDWARE FOR CONNECTING THE CONDUITS TO THE UNIT MUST BE RATED FOR OUTDOOR INSTALLATION AND BE INSTALLED PROPERLY TO MAINTAIN THE PROPER "RAINTIGHT" RATING ON THE UNIT.

⚠ CAUTION

DANGER OF INJURY - ELECTRIC SHOCK OR FIRE READ THE INSTRUCTION MANUAL BEFORE INSTALLATION, OPERATION, AND MAINTENANCE.

⚠ CAUTION

DANGER OF ELECTRIC SHOCK
DO NOT TOUCH THE APPARATUS WITH WET HAND.

⚠ CAUTION

DANGER OF ELECTRIC SHOCK.

TAKE OFF METAL OBJECT SUCH AS WATCH.

⚠ CAUTION

DANGER OF ELECTRIC SHOCK. USE INSULATING TOOL (SPANNER).

⚠ CAUTION

DANGER OF ELECTRIC SHOCK.
SPARE COMPONENTS SHOULD BE OF THE SAME RATING AND TYPE.
DO NOT USE OLD AND NEW COMPONENTS TOGETHER.

⚠ WARNING

DANGER OF ELECTRIC SHOCK.
DO NOT TOUCH LIVE PARTS

⚠ WARNING

DANGER OF ELECTRIC SHOCK
DO NOT REMOVE COVER

The caution, warning and warning labels in French for Quebec will be shipped loose inside the packet with the DC Quick Charger. These labels can be applied in the field.

The "WARNING" and "CAUTION" labels listed above are attached to the device. If the labels are rubbed off, peeled off, or damaged, purchase replacement labels from the distributor/vendor and replace the label in the original position on the device.

8. Installation

⚠DANGER

READ AND FOLLOW THE "SAFETY CONCERNS" AT THE BEGINNING OF THIS MANUAL BEFORE INSTALLING THIS DEVICE.

8.1 Installation Specifics

1. Installation Environment
   - Installation Site: Outdoor/indoor NEMA 3R "Rain Proof"
   - Ambient Temperature: -20 to 40 degrees C (-36 to 104 degrees F)
   - Relative Humidity: 5 to 80%, non-condensing
   - Altitude: 1,000 m (3,281 ft) or lower
   - Atmosphere: Containing no corrosive gas
2. Power Supply Environment
   - System Voltage: Three-phase and three-line 208V at 50 or 60 Hz
3. Installation Procedure
   This device shall be installed with the following procedure.
   1. Fix the channel base.
   2. Ensure a space for operation and maintenance in front of the device (1,000 mm [39.4 in.] or more).
   3. Ensure a space for air intake and cable retraction work on the right side of the device (500 mm [19.7 in.] or more).
   4. Ensure a space for air exhaust and door opening/closing on the left side of the device (500 mm [19.7 in.] or more).
   5. Fix the main body to the channel base.
   6. After the installation, remove the eyebolts and mount the roof with fixing screws.

Note: If the device is lifted with a crane or similar method, ensure that a four-point supporting method is used.

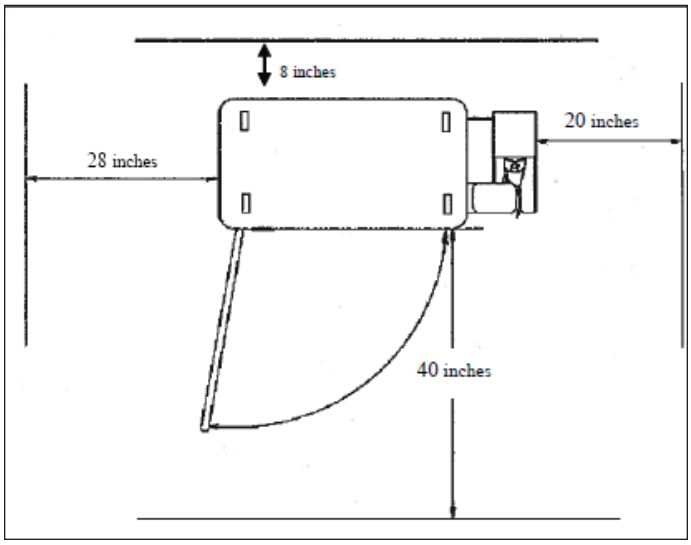


Figure 4. Arrangement Plan Shown with Space Accommodation for Second Connector on Left Side.

8.2 Wiring Connections

⚠DANGER

READ AND FOLLOW THE "SAFETY CONCERNS" AT THE BEGINNING OF THIS MANUAL BEFORE INSTALLING THIS DEVICE.

⚠CAUTION

EVEN WHEN OPERATION OF THE DEVICE IS STOPPED, PERFORM VOLTAGE DETECTION TO DETECT BATTERY CHARGE BEFORE ATTEMPTING ANY WIRING CONNECTIONS.

The wiring connections of this device shall be made with the following procedure.

1. Make sure the upstream breaker (MCCB or ELCB) for the AC power supply is OFF.
2. Make sure the AC input is 0 V.
3. Unlock the door and twist the handle to open the door.
4. Make sure the ELCB (8A) and ELCB (52R) of the device are both OFF.
5. Remove the panel in front of the connection terminals.
6. Connect the AC input cables and grounding conductors to the connection terminals and torque to 250 in./lbs.

This unit is to be connected to a grounded, metal, permanent wiring system; or an equipment-grounding conductor is to be run with circuit conductors and connected to equipment-grounding terminal or lead on battery charger. Connections to battery charger shall comply with all local codes and ordinances.

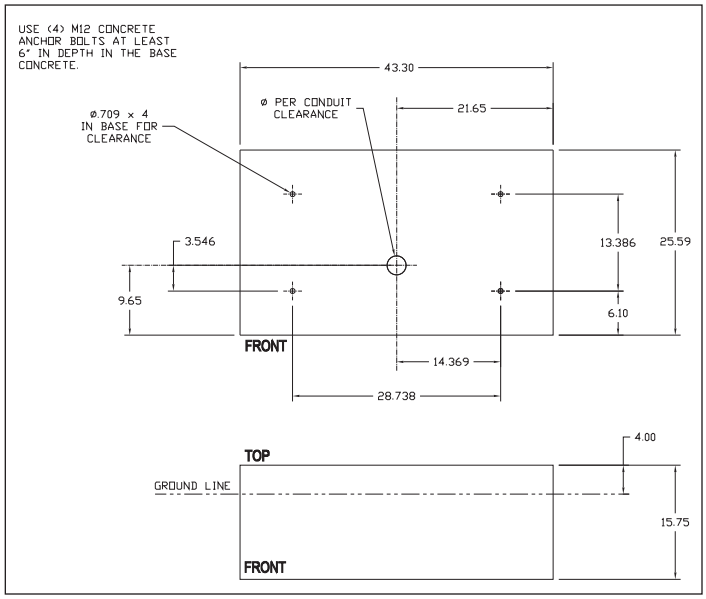


Figure 5. Concrete Pad Specifications.

8.3 Opening the Charger Maintenance Access Door

1. When the door is locked, the handle is latched in the retracted position. (Figure 6).

Figure 6. Locate Door Latch.

Figure 7. Release Handle.

2. Insert door key and turn the key 180º clockwise, then pull the handle outward. (Figure 7).

Figure 8. Rotate Handle.

3. Turn the handle 90 degrees counterclockwise to unlatch the door. (Figure 8).

To open the power feed connector door:

Locate the connector cover shown in Figure 9. To unlock the door, insert key into the lock located directly above the power feed connector door handle and turn 90 degrees. Pull the handle to open the door. When the door is unlocked, the key slot remains horizontal. The door has a magnet to secure the cabinet when not locked.

Figure 9. Power Feed Connector Door.

8.4 Part Names and Functions

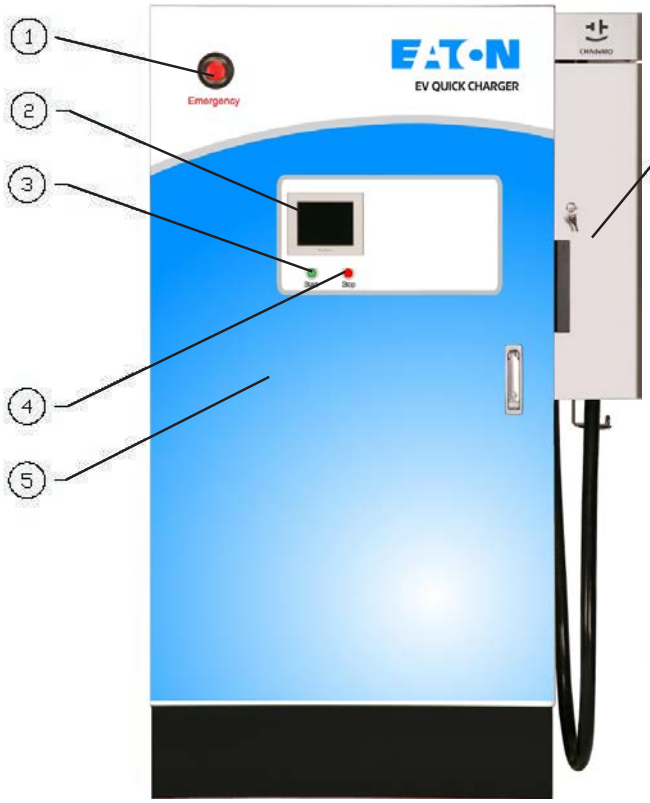


Figure 10. Outside View

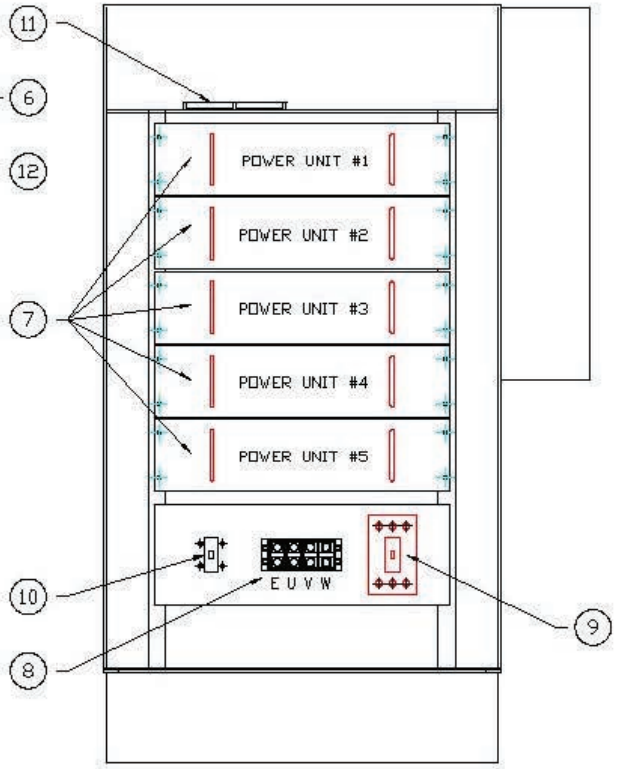


Figure 11. Inside View

1. EMERGENCY STOP Button
   - Use this button to shut down the device in an emergency situation. Pressing the E-Stop will shunt trip the internal breaker and require a reset in order to resume use.
   - Use (4) STOP button for normal shut down.
2. Touch-Screen Display
   - Operating states such as remaining charging time and failure information, if a failure occurred, can be displayed.
3. START Button
   - Use this button to start charging.
4. STOP Button
   - Use this button to stop charging.
5. Door
   - Open this door to operate the earth leakage circuit breaker (ELCB) switch in the device. See Section 8.3 for instructions on how to open the door.
6. Power Feed Connector
   - Electric vehicles can be charged through this connector (see pages 12-13 for directions of how to operate the power feed connector).
7. Power Units
   - AC inputs are converted into DC for charging through these units.
8. Connection Terminals
   - AC inputs and grounding conductors are connected with these terminals.
9. ELCB (52R)
   - The main circuit power supply can be turned on and off. AC inputs will be shut off in the event of a main circuit failure or serious failure detection.
10. ELCB (8A)
    - The control power supply can be turned on and off. AC inputs will be shut off in the event of a control power supply failure.
11. Sequence Unit
    - Communications with electric vehicles, power units, and touch screen as well as sequence controls for shutdown and other operations can be made in this controller.

8.5 Charger Start-up Procedure

The following is the procedure for initial energization of the charger.

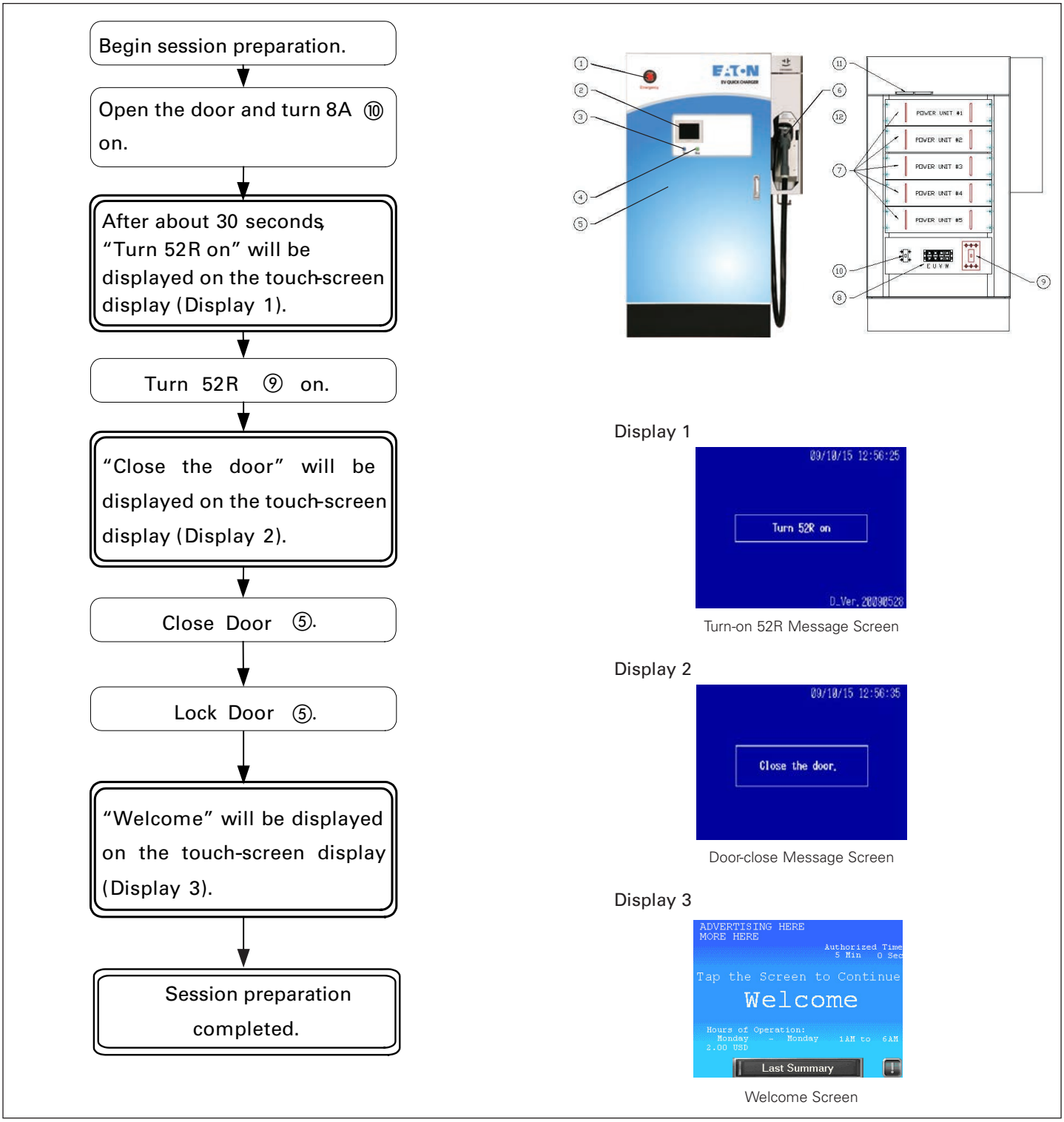


Figure 12. Typical User Set-up Procedure.

8.6 Operating Instructions

Instructions (as shown below in Figure 13) are affixed to the interior of the power feed connector cabinet.

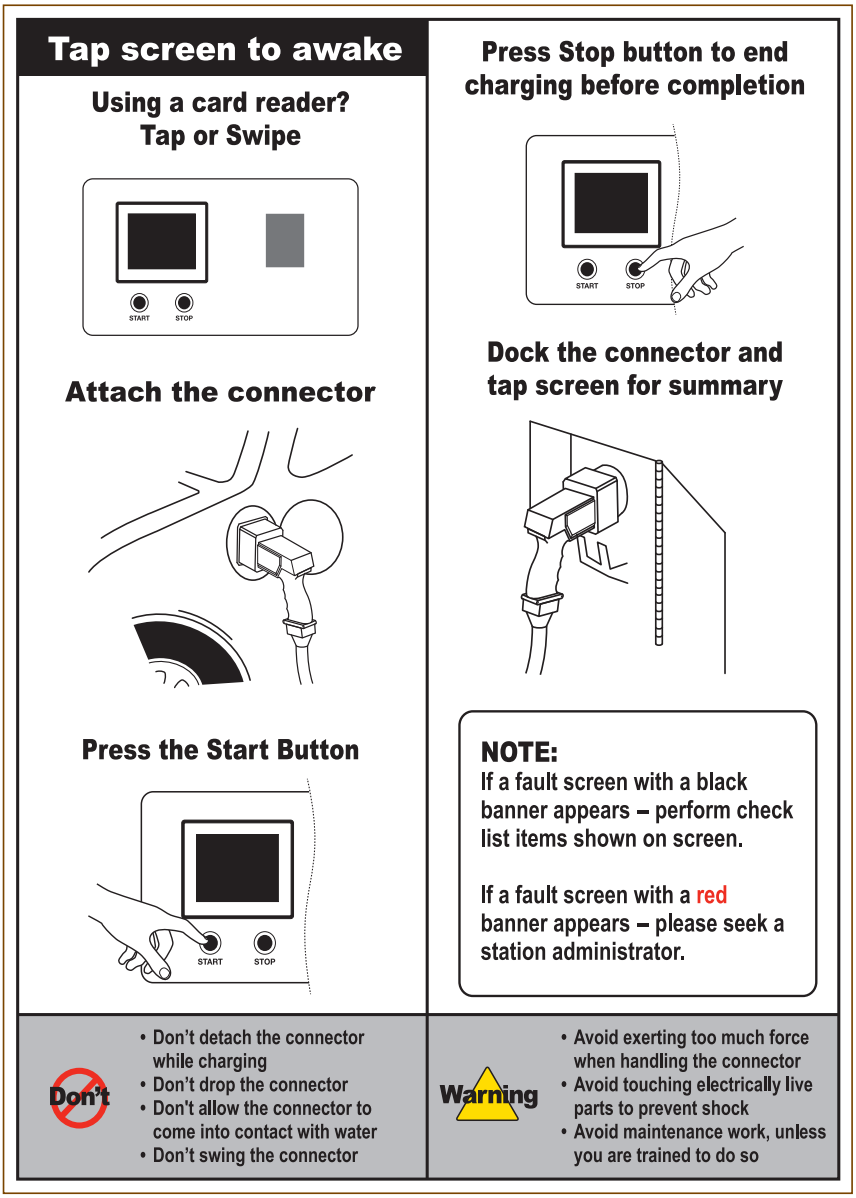


Figure 13. Instruction Label on the DC Quick Charger

1. Dismount the power feed connector.
   Touch screen to awaken display. Follow the prompts on the touch screen display. Dismount the power feed connector from the charger when prompted.

2. Attach the power feed connector to the vehicle.
   While holding the grip, insert the connector while pressing inward at the angle of the vehicle inlet. When the connector is properly seated in the vehicle, as shown in Figure 15, the release button will extend outward.

3. Press the NEXT button, then press the START Button on the charger. A light on the release button will illuminate and the start button on the charger will blink.

4. To End: Press the stop button on the charger.
   After pressing the stop button, the light will turn off when it is time to remove the connector from the vehicle. Then remove by holding down the release button on the connector. Continue to press this button while removing the connector from the vehicle.

5. Return the connector to the charger.
   Return the connector to its original postition on the charger. Hang up the cable and close the cover.

Operations Completed.

Check the display screen to complete your session.

8.7 Power Feed Connector

The power feed connector is located behind the key-lockable door as shown in the photo below. See Section 7.6 for instructions on how to open this door.

Figure 14. Location of the Power Feed Connector

.

The power feed connector can be released using the release button (#13). After the charger has been stopped, press and hold the release button (#13), and the power feed connector can be released from the electric vehicle.

Figure 15. Power Feed Connector

Figure 16. CHAdeMO connector seated in vehicle

9. Configuration

Please reference the Following Configuration Reference Guide for specific features,descriptions and parameters. Sections 9.1 and 9.2 follow the table with information on the IP Address and Fault Logs.

Table 3. Configuration Reference Guide.

Feature	Units	Description	Range	Management	Factory Default
IP Address		Internet protocol address code that gives the location of the device		Local	192.168.2.40
Max Output Power	kWh	The maximum output of the DCQC	10 to 50 kWh	Local or Remote	Depends on configuration
Max Charge Time	Seconds	The maximum time allotted for charger use when configured with a Time Based Credit Card Reader	0 to 15300	Local or Remote	300
Title		The name given to a particular charger for remote identification referred to as "Charger Name" in the Modbus Register Map		Local or Remote	blank
Model Number		Charger Model number	14 characters	Factory set	
Serial Number		Unique factory set number to represent charger		Factory set	Unique factory set number
Price	USD	Price for accessing the charger. When managed locally, it is just for informational purposes only		Local or Remote	blank
Start/Stop (HOO)	Day of week Hour	Hours of operation to the charger's use. For informational purposes only.	Monday – Sunday 1-12 AM or PM	Local or Remote	blank
Credit Card Mode		Credit card payment authorization method	Time or Session	Local	Time
Time Increment	Seconds	Sets the allotted time for each pulse sent by the credit card reader		Factory set	300
Permissive Mode		Can be used as a master enable/disable for the charger (AND), or a method of authorizing the charge session (OR)	AND or OR	Local	OR
ChargePoint		ChargePoint Network enabled feature	Yes or No	Remote	No
Time		A setting of the current date and time. This impacts the time stamps for the charging and failure log history		Local or Remote	
Address		This is the physical location of the charger		Local or Remote	blank
Curtailment		Adjustable power output reduction settings		Remote	
Logging	As shown in Table 4	Session detail and fault logs		Remote	
Advertising	ASCII	Scrolling message at the top of all HMI Screens.	75 characters	Local or Remote	

Note: Local indicates management that can be performed from the charger Display screen.

9.1. Connecting via IP Address

The IP Address for the charger is programmed in the factory and provided with shipment as indicated in Table 4. This can be accessed via a local Ethernet connection. Usage and Fault logs are available over the Ethernet connection.

Note: If more than one DCQC will be on the same LAN the IP Address will have to be adjusted; consult with factory.

9.2 Usage and Fault Logs

The HMI will log usage data by start and stop records for charge sessions and faults when they occur into one file which can be accessed over an Ethernet connection via a static IP address. There are two log files that are saved – one for current data and one for archived data. The current data is saved into the archived data when it reaches 120,000 logs. Depending on the usage of the charger, the log files should be able to contain more than one year of data.

The file format is shown in Table 4.

Table 4. Log File Format.

Date	Time	Code	Charge Time	SOC	kWh	Fault
Date the record was reported	Time the record was reported	Indicates whether the log is a fault (99), start of a session (2), or an end of a session (3)	Length of the charge session in seconds	Percentage representing State of Charge (SOC) reported from the car; the value range is 0-100	Total kilowatt-hour delivered to the car; this value is not valid when the Code value equals 2. This value is a floating point number i.e. 1.2 kWh	Fault code when the code is 99

10. Operating Procedures

⚠DANGER

A KEY IS ATTACHED TO THE BOARD DOOR. LOCK THE DOOR AT ALL TIMES TO PREVENT THE DOOR FROM BEING OPENED UNNECESSARILY. KEEP THE KEY IN A SAFE PLACE.

10.1 User Setup Instructions

The following shows the user set-up procedure:

Go to User Maintenace Menu.

1. From the Welcome screen, hold upper left corner of screen for 5 seconds until password entry key-board is shown (Display 1).

2. Enter password and press ENT. This will bring you to the User maintenance menu. Password is found on the interior of the charger door (5) (Display 1).

User Maintenance Menu Screen
Various settings can be adjusted via the User Maintenance Menu screen. Fault History and detail can also be viewed. See Troubleshooting section 11 on page 23 (Display 2).

Setup Output Rating

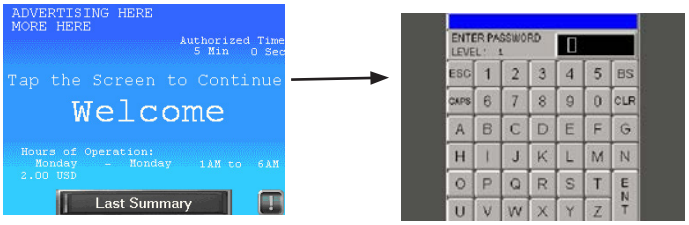
1. From User maintenance menu, press the Output Setting button (Display 3).

2. Click on each value to change.

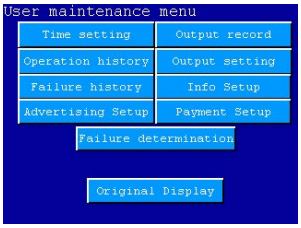
3. Put contact information for the administrator (i.e. phone number, email address - max. 16 characters).

4. Press the Save button (Display 4).

Display 1

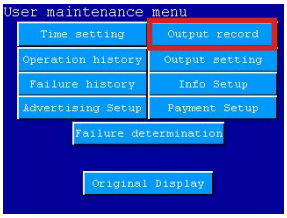


Display 2



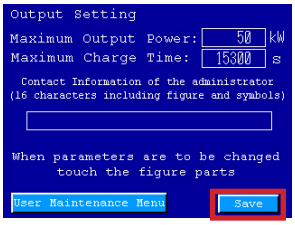
User Maintenance Menu

Display 3



Output Setting Button

Display 4



Output Setting Screen

Figure 17. Typical User Set-up Procedure.

10.2 Charger Information Set-up

1. From User maintenance menu, press the Info Setup button (Display 1).

2. View the settings (Display 2).

Charger Title is displayed on the info screen. It is 30 characters long. This is provided as Read/ Write over Modbus. (A)

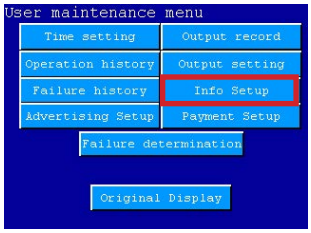
Model number and Serial number are displayed on the info screen and are factory programmed and provided as Read Only over Modbus. (B)(C)

Address is displayed on the info screen. The first two boxes are 30 characters long. The third box is 8 characters long. This is provided as Read/Write over Modbus. (D)

Price is displayed as text on the welcome and info screens. It is 22 characters long. This is provided as Read/Write over Modbus. (E)

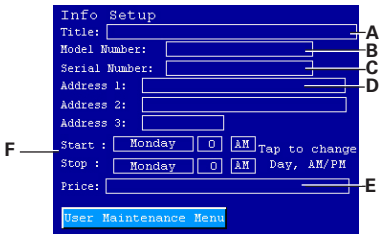
The Start and Stop parameters are shown on the welcome and info screens. These are used to indicate hours of operation to the user. These parameters DO NOT control the charger. They are for information purposes only. (F)

Display 1



Info Setup Button

Display 2



View the Settings

Figure 18. Setup Charger Information

10.3 Payment Method Setup

1. From User maintenance menu, press the Payment Setup button to view current settings (Display 1).

2. Each setting is defined as follows.

Set to Enabled when configured with the credit card swipe reader, otherwise, Disabled. (A)

Set to Time as a default. When ordered with the charger it could be Time or Session. Time based requires a fee to be paid by an increment of time – 5 minutes. This will work like a parking meter and will allow for any number of sessions within the paid amount of time. Session based requires a flat fee to access the charger regardless of time connected.
At the end of the session – charger stopped or charge complete, the user will have to reauthorize the charger through the credit card reader to restart session. Authorized time will be displayed during the charge session. The price can be changed locally by the owner but would require an update to USA Technologies for proper price point display on the reader. (B)

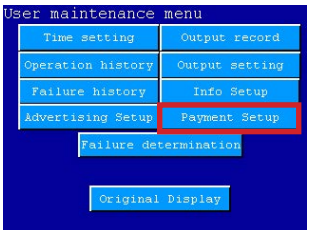
Time increment is related to the Time Based credit card swipe option. This is the time allocated for the credit card reader increments. This is factory programmed at 300 seconds. (C)

Set to enabled when RFID Basic option is ordered, otherwise Disabled. (D)

Permissive Mode determines whether the permissive run is a master enable/disable for the charger (AND) or a method of authorizing the a charge session (OR). In OR mode the other methods of authorization are able to enable charging. In AND mode the permissive run input is required to be 24V to enable charging regardless of the other modes. The Modbus authorization however can trump the permissive run 'AND' mode. (E)

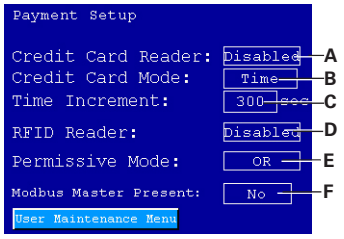
Set to Yes when the charger is ChargePoint enabled. (F)

Display 1



Payment Setup Button

Display 2



View the Settings

Figure 19. Payment Method Setup.

10.4 Time and Date, and Advertising Setup

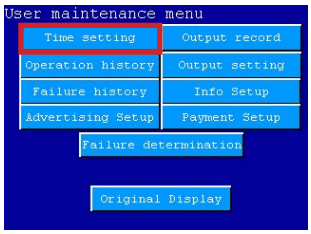
Time and Date Setup

1. From User maintenance menu, press the Time setting button (Display 1).

2. Click on each value to change time and date. Note the charger will not automatically adjust for Daylight Savings Time (Display 2).

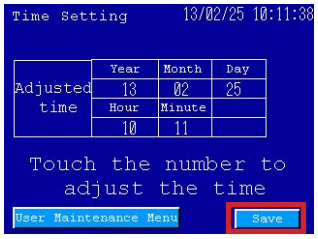
3. Press the Save button (Display 2).

Display 1



Time and Date Setup Button

Display 2



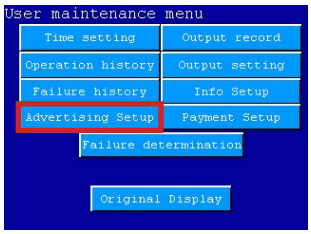
Save Button

10.5 Advertising Setup

1. From User maintenance menu, press the Advertising Setup button (Display 1).

2. Click on each box to change. There are 60 available characters total – the boxes are concatenated to form the 60 character messages. The advertising message is displayed as it looks in these boxes across the top of all display screens.

Display 1



Advertising Setup Button

Display 2

Notice: If remote messaging is utilized (via Modbus or ChargePoint) it will over-write a locally entered advertising message.

Notice

Figure 20. Time and Date, and Advertising Setup.

10.6 Charging Operation Procedure

The following shows the operating procedure for a charging session:

⚠CAUTION

FOR BASIC OPERATION SEE CHARGER INSTRUCTION LABEL LOCATED ON THE INTERIOR OF THE POWER FEED CONNECTOR CABINET FOR REFERENCE.

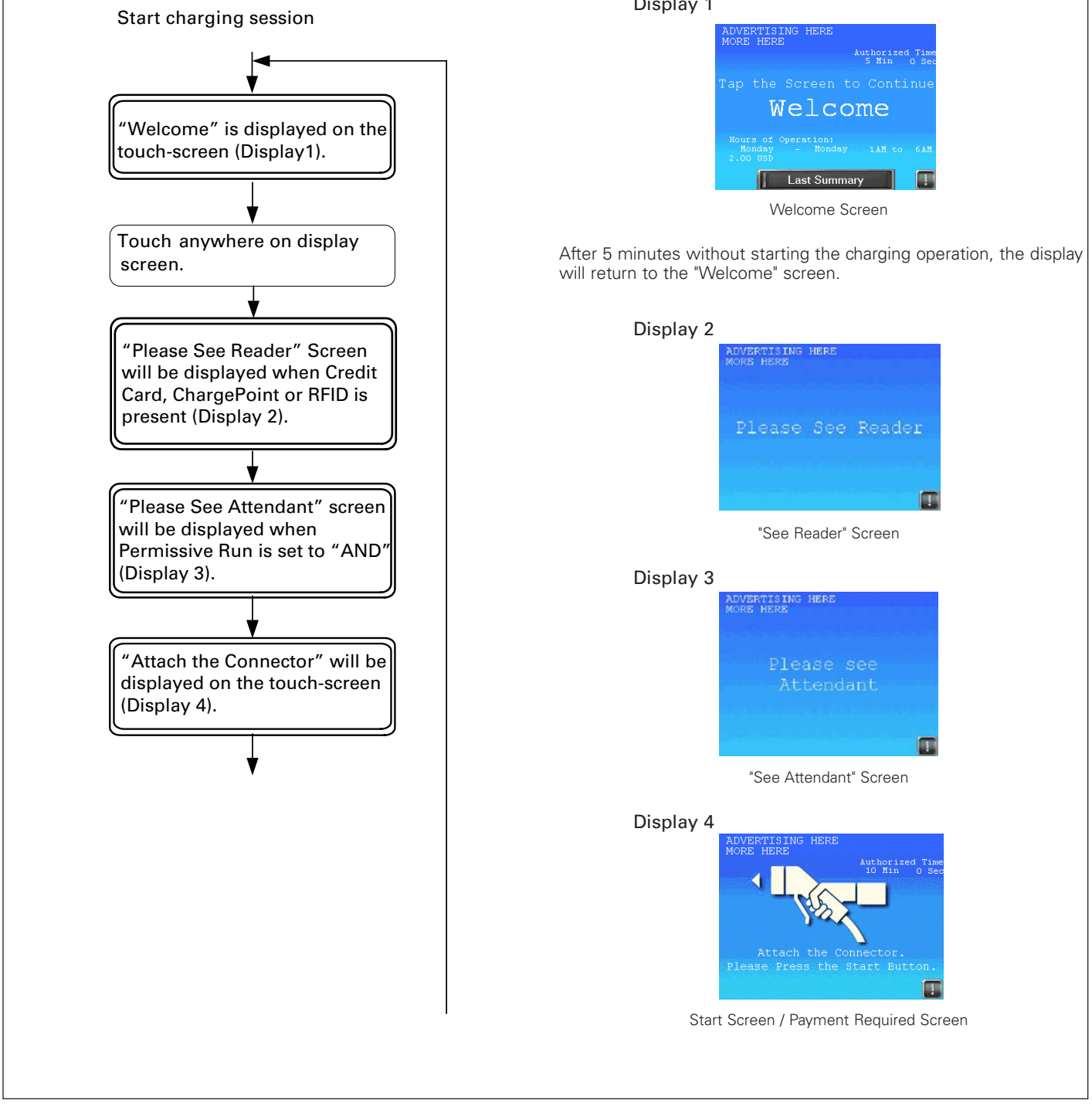


Figure 21. Typical Operating Procedure for a Charging Operation. **(Continued on next page).**

(Continued from previous page).

Attach Power Feed Connector to the electric vehicle. After the connection, press the NEXT button on the screen.

Press START button ③ on the front surface of the board.

"Wait for a Moment" will be displayed on the touch-screen display (Display 5). Then the screen will then blink on and off reading "Battery is being checked/ Under preparation as the charger checks for connection insulation." The display will then switch to the next screen.

"Charging" will be displayed on the touch-screen display (Display 6) along with the remaining battery capacity and charge time.

Start charging.

Charging completed.

After 5 minutes without starting the charging operation, the display will return to the "Welcome" screen.

Display 5

Pre-charging screen test

Display 6

Charging Screen

Figure 23. Typical Operating Procedure for a Charging Operation **(Continued on next page).**

(Continued from previous page).

"Please Dock the Connector" will be displayed on the touch-screen (Display 7).

Detach the Power Feed Connector (6) and return to its original position as described on the display. When the connector is in its original position, tap the screen for a summary (Display 8).

The current session charging summary (Display 9) will be displayed. After 10 seconds, the display will return to the "Welcome" screen or Tap the screen to advance to the Welcome screen.

"Please Wait - Do Not Touch - Changing Maximum Power And Charging Time" will be displayed on the screen (Display 10).

Display 7

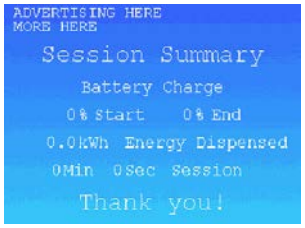
Dock the Connector and Advance to Summary Screen

After 5 minutes without pressing the NEXT button, the display will proceed to the "Summary" screen.

Display 8

Advance to Summary Screen

Display 9



Summary Screen

Display 10

Curtailment Screen

Note: When Modbus address 1102 or 1103 is written to with a different value, the HMI will update the maximum power output of the charger or the maximum charge time. If the display is on one of the pre-charging screens (Welcome, Connect Connector, Start Button), the display will switch to the Output Setting screen and change the max power output rating.
If the display is on one of the charging screens, it will pause the charge session and go to the screen shown below. After a few seconds it will switch to the Output Setting screen and change the max power rating. Once the max power rating is changed, the display will restart the charge session with the newly set max power or charge time.

Figure 23. Typical Operating Procedure for a Charging Operation.

10.7 Complete Stop Procedure

⚠DANGER

A KEY IS ATTACHED TO THE BOARD DOOR. LOCK THE DOOR AT ALL TIMES TO PREVENT THE DOOR FROM BEING OPENED UNNECESSARILY. KEEP THE KEY IN A SAFE PLACE.

The following shows an operating procedure for complete stop after a charging operation:

Important! Do not follow the directions on the display.

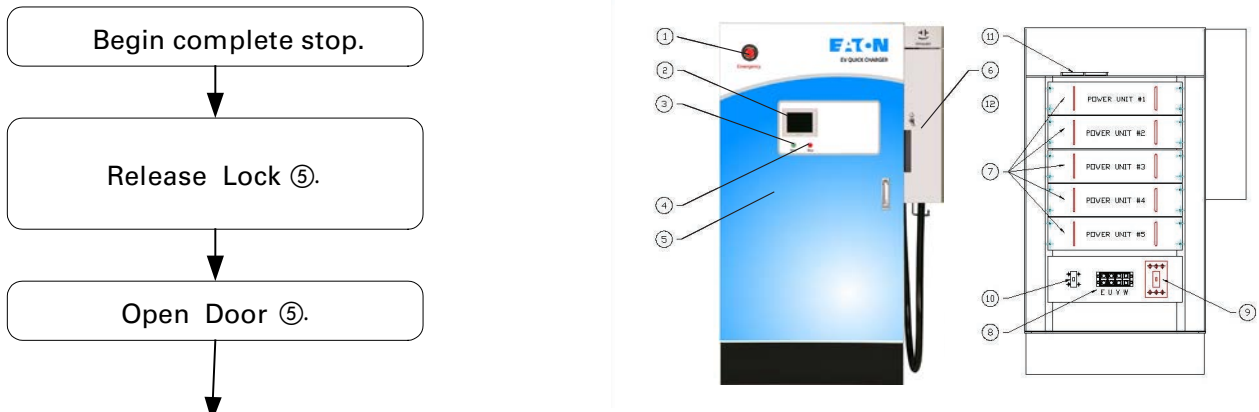


Figure 22. Operating Procedure for Complete Stop After a Charging Operation.

10.8 Failure Mode Procedure

When a failure occurs, shut down the charger to confirm the failure details and perform a recovery operation according to the procedure in the following section, "11. Troubleshooting".

11. Troubleshooting

When a problem occurs in the charger, confirm the failure details based on the type of error screen displayed and perform the recommended recovery operation.

After completing the recommended recovery operation, run the charger according to Section 10.6 - Charger Operation Procedure.

IF YOU CANNOT RECOVER OR RUN YOUR CHARGER, PLEASE CONTACT EATON TECHNICAL SUPPORT

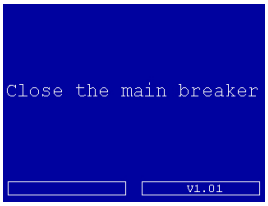
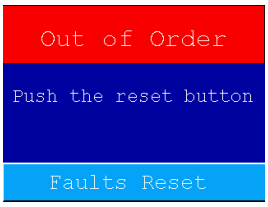
VIA EMAIL AT EVSETECH@EATON.COM OR BY CALLING

1-855-ETN-EVSE (1-855-386-3873) MONDAY-FRIDAY, 8AM-6PM EST

EXCLUDING HOLIDAYS.

11.1 Error Screens

The following are possible error screens which may appear if the charger is experiencing an issue.

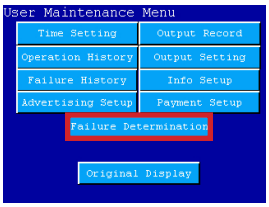
	If the charger is off, energize the charger; it should boot to the WELCOME screen.	
Error Screen 1	If CLOSE THE MAIN BREAKER is displayed: A. Reset the main circuit breaker as described in section 11.3.	
Error Screen 2	If OUT OF ORDER is displayed: A. Press the FAULTS RESET button.	
Error Screen 3	If OUT OF ORDER: CONTACT SYSTEM ADMINISTRATOR is displayed : A. Check to see if the Emergency Stop button has been pressed. To reset the emergency stop see section 11.4.	
Error Screen 4	If FAULTS DETECTED IN THE VEHICLE is displayed: A. Press STOP ALARM. B. Verify the vehicle is turned off and retry.	
Error Screen 5	If FAULTS DETECTED IN THE CHARGER is displayed: A. Press STOP ALARM. B. Retrieve Failure Codes.	

11.2 Retrieve Failure Codes

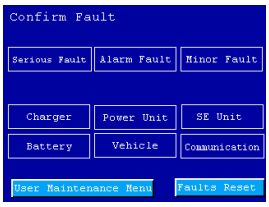
If a problem has occurred with the charger which requires obtaining the Failure Codes, perform the following steps

Press and hold the top left corner of the display screen for five seconds. You should be prompted for a password. ENTER PASSWORD provided with the product (located on the inside of the door) and press enter.

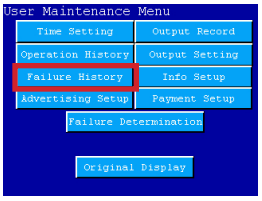
Press FAILURE DETERMINATION.



The possible failure modes will be highlighted on this screen. Record which icons are highlighted, if any. Press USER MAINTENANCE MENU to exit the Failure Determination screen.



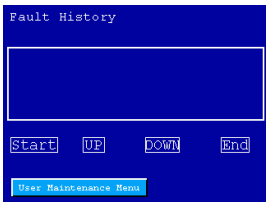
Press FAILURE HISTORY.



The Failure History screen will display the failure codes are listed in chronological order, with the most recent fault at the bottom. Active failure codes will be highlighted in red; past failure codes will not be highlighted. You can press the on-screen "start" key and use the "up" and "down" keys to navigate through the log.

Record the date, time, and four-digit failure codes from the most recent few charging sessions.
Note: If the clock was not set, note the timestamps may not correspond to the actual time and date.

Press "User Maintenance Menu" to exit the Failure History menu.



11.3 Power Unit Failure

If a power unit fails, the charger will temporarily stop and the driver can decide whether to continue with the session at a decreased charging capacity, or stop charging. If it is a paid time-based session, the charging time will be paused until the driver responds.

If more than one power unit fails, the charger will no longer function until maintenance is performed. To replace a power unit, consult Eaton representative.

11.4 Reset the Main Circuit Breaker

1. De-energize the charger.
2. Open the door to the charger and locate the large circuit breaker in the bottom right of the unit.
3. Press the breaker switch completely downward (open) until it locks in place.
4. Pull the breaker switch upward (closed) until it locks in place.
5. Close and lock the door to the charger.

11.5 Reset the Emergency Stop

1. De-energize the charger.
2. Press the large red "Emergency Stop" pushbutton on the front door to engage it, then twist it 45° clockwise to disengage it.
3. Reset the main circuit breaker as outlined in section 11.4.
4. Re-energize the charger.

Tables 5 through 8 serve as legends for DC Quick Charger failure codes.

Table 5. Failure History Item List
(B) Alarm Failure Items: Device Shutdown, 52R Remains Closed.

Code No.	Item	Reason for Occurrence
2102	Door opened	Door is opened during operation
1210	Vehicle error (not "P")	Vehicle is not in "Park"
1209	Vehicle error (non-chargeable)	Vehicle detects non-chargeable state
1211	Vehicle error (other)	Vehicle detects other failures
1204	Battery error (increased temperature)	Vehicle detects increased battery temperature
1203	Battery error (current difference)	Vehicle detects a difference in requested and supplied battery currents
1202	Battery error (voltage shortage)	Vehicle detects shortage of voltage to the battery
1201	Battery error (overvoltage)	Vehicle detects too high of a voltage to battery (overvoltage)
1205	Battery error (voltage difference)	Vehicle detects difference in requested and supplied battery voltages
2104	Vehicle charging conditions incompatible	Charging voltage or charging time set by the vehicle is incompatible
2105	Battery voltage incompatible	Maximum output voltage of the charger and the upper limit of battery voltage are incompatible
2223	Vehicle IF error (enable)	No charging ready signal is received from the vehicle
2226	Vehicle IF error (completion)	No charging completion signal is received from the vehicle within a predetermined time
2222	Voltage error (before locking)	Voltage applied before locking the power feed connector
2228	Voltage error (before charging)	Non zero voltage before charging starts
2118	Voltage error (during charging)	Voltage does not increase to a proper value
2225	Voltage error (after charging)	Voltage remains when unlocking the power feed connector
2230	Grounding automatic checking error	Grounding relay error is detected
2107	PU communication error	Power Unit (PU) communication error is detected
2227	PU response error	PU non-response is detected
5m22	PUn output overvoltage	Overvoltage occurs to DC output of the n th. PU
5m21	PUn output overcurrent	Overcurrent occurs to DC output of the n th. PU
5m26	PUn excess intermediate voltage	Excess intermediate voltage in the n th PU
5m20	PUn control power supply error	Abnormally low voltage of the power supply to the control circuit in the n th. PU
5m19	PUn control error	Control board error
5m48	PUn rectifier error	Rectifier error
5m47	PUn DC converter error	DC converter error
5m05	PUn error	PU error detected

Notes:
1. PU means Power Unit.
2. "n" represents an integer from 1 to 5.
3. "m" represents an integer from 0 to 4, respectively, for PU1 to PU5. m=n-1

Table 6. Failure History Item List.
(C) Minor Failure: Charger Still Operational.

Code No.	Item	Reason for Occurrence
1007	Temperature increase	Temperature in the charger increases
5m25	PUn intermediate voltage shortage	Intermediate voltage is too low
2231	RTC backup battery voltage reduction	Real time clock (RTC) battery voltage on the sequence board is too low

Notes:
1. PU means Power Unit.
2. "n" represents an integer from 1 to 5.
3. "m" represents an integer from 0 to 4, respectively, for PU1 to PU5. m=n-1.

Table 7. Failure History Item List.
(D) Consolidated Display Items.

Code No.	Consolidated Item	To be Detected
2112	PU alarm	Alarm failure items: charger shutdown, 52R remains closed
2114	PU minor failure	Minor failure: charger still operational
2115	Vehicle error alarm	Vehicle error detected
2116	Battery error alarm	Battery error items detected
2117	Communication error alarm	Vehicle communication error detected
2108	Major charger failure	Major charger failure detected
2109	Charger alarm	Charger alarm stop items detected
2110	Appliance minor failure	Minor charger failure detected
2013	Major failure	Major failure detected
2014	Alarm	Alarm stop items detected
2015	Minor failure	Minor error detected
1003	Emergency stop	EMERGENCY STOP button pressed

Note 1) PU means Power Unit.

Table 8. Failure History Item List.
(A) Serious Failure Items: Device Shutdown, 52R Trip.

Code No.	Item	Reason for Occurrence
1006	Input ELCB activated	Tripped due to input circuit grounded, shorted, or other serious failure
1012	Output grounded	Output circuit is grounded*
2224	Output fuse blown	Output circuit fuse is blown
2103	Current error (during charging)	Discrepancy between vehicle current demand and output current
2229	Current error (after charging)	Current continues to flow after charging has ceased
2101	Connector insulation failure	Failure in proper mating of power feed connector with the connector on the vehicle
1011	Connector lock failure	Failure in power feed connector lock
1009	Control power supply failure	Low power supply voltage to the control board
2106	Vehicle communication error	Error in communication with vehicle

* Pressing the Emergency Stop pushbutton can also result in this failure code.

12. Maintenance Check

⚠DANGER

READ AND FOLLOW THE "SAFETY CONCERNS" AT THE BEGINNING OF THIS MANUAL BEFORE USING THIS DEVICE

⚠DANGER

A KEY IS ATTACHED TO THE BOARD DOOR. KEEP THE DOOR LOCKED AT ALL TIMES TO PREVENT UNNECESSARY OPENING OF THE DOOR. KEEP THE KEY IN A SAFE PLACE.

12.1 Maintenance Check Precautions

Each of the capacitors in this device have a high voltage for a time after shutting off the input power supply. Check for the voltage of each part before performing maintenance checks.

12.2 Maintenance Check Items

Perform periodic checks.

The check items and cycle of this device vary depending on its installation environment, service conditions, etc. Refer to Section 12.5 - Maintenance Check Item List as a guide.

12.3 Visual Check Items

1. Check for abnormal sound from running fans and power units. If there is abnormal sound, please contact an Eaton representative for further assistance.
2. Check for abnormal odor, changes of inner materials, corrosion, anomaly in appearance, etc., in this device. If there are any anomalies, please contact an Eaton representative for further assistance.
3. Check for dust and dirt in this device regularly and, if any is found, clean using appropriate procedures.

12.4 Replacement of Fixed-Life Components

To prevent the device from failure due to worn out components, it is necessary to replace the components before they reach the end of their lifespan. Use the following replacement intervals as a guideline for the estimate of the total running time. Please contact an Eaton representative for further assistance when you replace the parts.

1. Power feed cable: Approximately three (3) years.
2. Intake and exhaust filters: Approximately three (3) years.

Note: Please keep in mind that the replacement interval of each part can vary depending on, for example, the usage environment of the device.

⚠CAUTION

IF YOU NEED MAINTENANCE CHECK ASSISTANCE OR SPARE COMPONENTS, PLEASE CONTACT AN EATON REPRESENTATIVE AT 1-855-386-3873 FOR FURTHER ASSISTANCE.

12.5 Maintenance Check Item List

The following table is a list of general check items and cycles for periodic maintenance. Use this for reference.

Table 9. General Check Items and Cycles for Periodic Maintenance.

Maintenance Item and Method	Criterion	Action	Cycle		
			Daily or at Every 50 Chargings	3 to 6 months	3 to 7 years
Abnormal sound	Presence of abnormal sound	If the abnormal sound has gotten gradually louder, check for defective parts at your convenience. If sound becomes loud suddenly, shut the device down immediately and check defective parts	○		
Check inside device	Presence of abnormal odor, transitions of inner materials, corrosion, anomaly in appearance, etc.	If there are any anomalies, please contact an Eaton representative for further assistance		○	
Cleaning of intake and exhaust filters		Detach the filters, remove dust using a vacuum cleaner or similar device, and attach the filters again		○	

12.6 Filter Cleaning Procedure

1. Open the front door of the unit.
2. Remove the two fixing screws on the filter assembly.

Figure 23. Filter Cleaning Procedure.

3. Pull the filter assembly out.

Figure 23 shows the filter unit.

- The right side is for air intake, including an insect screen, a drain, and a filter from outside.
- The left side is for exhaust ventilation, including an insect screen and a drain from outside.

(Right: for Air Intake, Left: for Exhaust Ventilation)

Figure 24. Filter Unit.

4. Remove any dust from the insect screen, drain, and filter using a vacuum cleaner or similar device. If the filter is stained seriously, wash in water and then dry completely to restore.

DC Quick Charger Installation and Maintenance Manual

For more information, visit **www.eaton.com/plugin,**
call **1-855-ETN-EVSE (1-855-386-3873),**
or call your local Eaton sales office.

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December 2013

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Canadian Operations
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EatonCanada.ca

Powering Business Worldwide

DC Quick Charger for electric vehicles

Overview

As the demand for electric vehicles (EV) grows, there is increased demand for robust and accessible EV charging infrastructure. Eaton meets this demand with a full family of charging solutions designed to fit seamlessly into a busy lifestyle, whether the needs require residential, commercial, or quick EV charging.

Product description

Eaton's DC Quick Charger (DCQC) is the ultimate in EV rapid charging. Housed in a floor-mounted NEMA® 3R enclosure, the DCQC communicates with the EV's battery management system to provide direct current flow to charge the battery. This gives the ability to charge an EV battery to 80% capacity in as few as 30 minutes. The 50 kW charger housing consists of five individual 10 kW power drawers, giving the flexibility to offer a 20 kW, 30 kW, 40 kW, or 50 kW configuration. In addition, at each output level, the DCQC has N-1 capability, which allows the charger to remain operational at a reduced output with the loss of one power drawer. Eaton's DC Quick Charger is available with additional options for revenue collection and networking as well as the option for the SAE™ combined charging connector ①, making it easy to adapt to meet a buyer's needs.

① Please consult the manufacturer for availability.

NASCAR GREEN™

EATON
Powering Business Worldwide

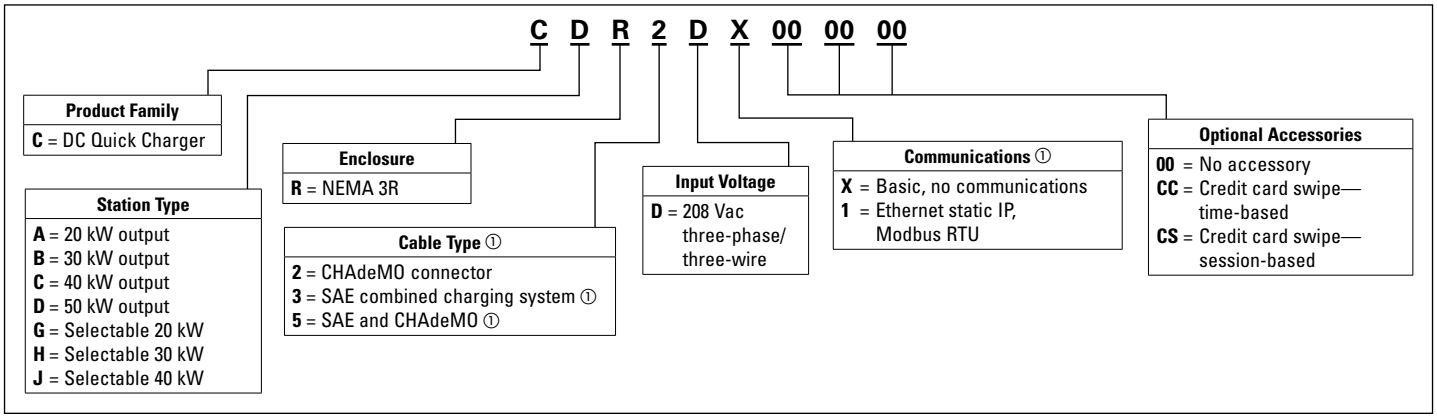
Standard features

- Up to 50 kW output DC charging
- NEMA 3R exterior enclosure
- Full-color touch screen display
- Key-lockable connector for security
- Eaton's standard one-year warranty on all electrical components and housing per Selling Policy 25-000

Standards compliance

- CHAdeMO version 0.9
- NFPA® 70 National Electrical Code,® Article 625 Electric Vehicle Charging System
- UL® 2202—Safety for Electric Vehicle (EV) Charging System Equipment
- UL 2231—Personnel Protection Systems for EV Charging Circuits
- UL 2594—EV Supply Equipment (Outline of Investigation)
- UL 991—Safety-Related Controls Employing Solid-State Devices
- FCC compliant
- CSA® C22.2 #107

Table 1. Catalog Numbering System—DC Quick Charger



① Refer to Communications Guide PA191003EN for more details.

② Consult manufacturer for availability.

Table 2. Weights

Description	Weight Unpackaged (Packaged) ①
Standard 50 kW DC quick charger; single 15-foot cable	770 (800)
Standard 40 kW DC quick charger; single 15-foot cable	720 (750)
Standard 30 kW DC quick charger; single 15-foot cable	670 (700)
Standard 20 kW DC quick charger; single 15-foot cable	620 (650)

① All weight in lbs.

Specifications

Table 3. Technical Specifications

Description	
Incoming voltage and connections	208 Vac three-phase, three-wire (Line 1, Line 2, Line 3 and earth ground)
Input amperage	156A (any power configuration)
Input frequency	50/60 Hz
Integral overcurrent and GFI protection	200A with 300 mA earth leakage for 40–50 kW configurations 100A with 500 mA earth leakage for 20–30 kW configurations
Upstream protection	Per NFPA 70 National Electrical Code, Article 625.14
Output amperage—maximum continuous	Up to 125A DC
Output voltage	Up to 400V DC
Interlocked power output	Yes
Ground fault	13 mA (UL 2231-1 / UL 2231-2 personnel protection)
De-energization on breakaway	Yes
Surge withstand	Up to 6 kV at 3000A
Conduit entry	Front, rear, side, bottom

Table 4. Physical and Environmental Specifications

Description	
Language	English ①
Cable length	15 feet
Dimensions H x W x D in inches (mm)	66.00 x 44.00 x 17.75 (1676.4 x 1117.6 x 450.9)
Operation	Touch screen interface, start and stop buttons, emergency stop button
Ingress protection / NEMA type	IP14 / 3R
Operating environment	Ambient temperature: –31°F to +104°F (–35° to +40°C)
	Ambient humidity: 5 to 80%
	Altitude: 3281 ft (1000m) or lower
	Atmosphere: containing no corrosive gas

① Consult factory for available options.

Table 5. I/O Specifications

Description	
Permissive run	24 Vdc digital input
HMI upgrade port	USB

Table 6. Optional Features

Description	
Credit card swipe	Time-based: Authorization expires when time runs out
Credit card swipe	Session-based: Authorization expires when car stops charging or car is unplugged
Networking	Requires third-party service provider ①

① Refer to Communications Guide for detail PA191003EN.

Installation

The DC charger's electric requirements and wiring installation procedure can be performed by any qualified electrician. The installation shall follow the requirements of NEC® Article 625. For convenience, the pad specification is shown in **Figure 1**. Additional drawings can be obtained upon request.

See installation guide IM0EV00001E for more details.

For more information, visit www.eaton.com/plugin, call 855-ETN-EVSE (855-386-3873), or call your local Eaton sales office.

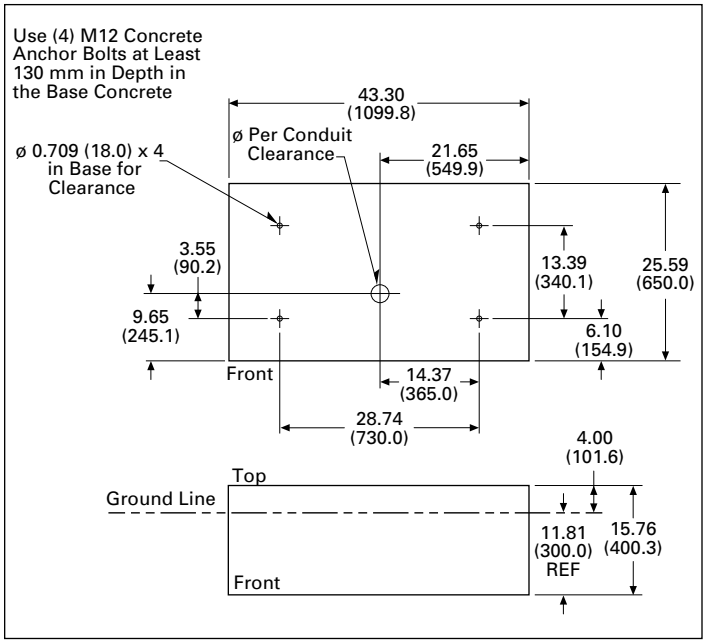


Figure 1. Floor-Mount DC Charger Pad Specification

Eaton
1000 Eaton Boulevard
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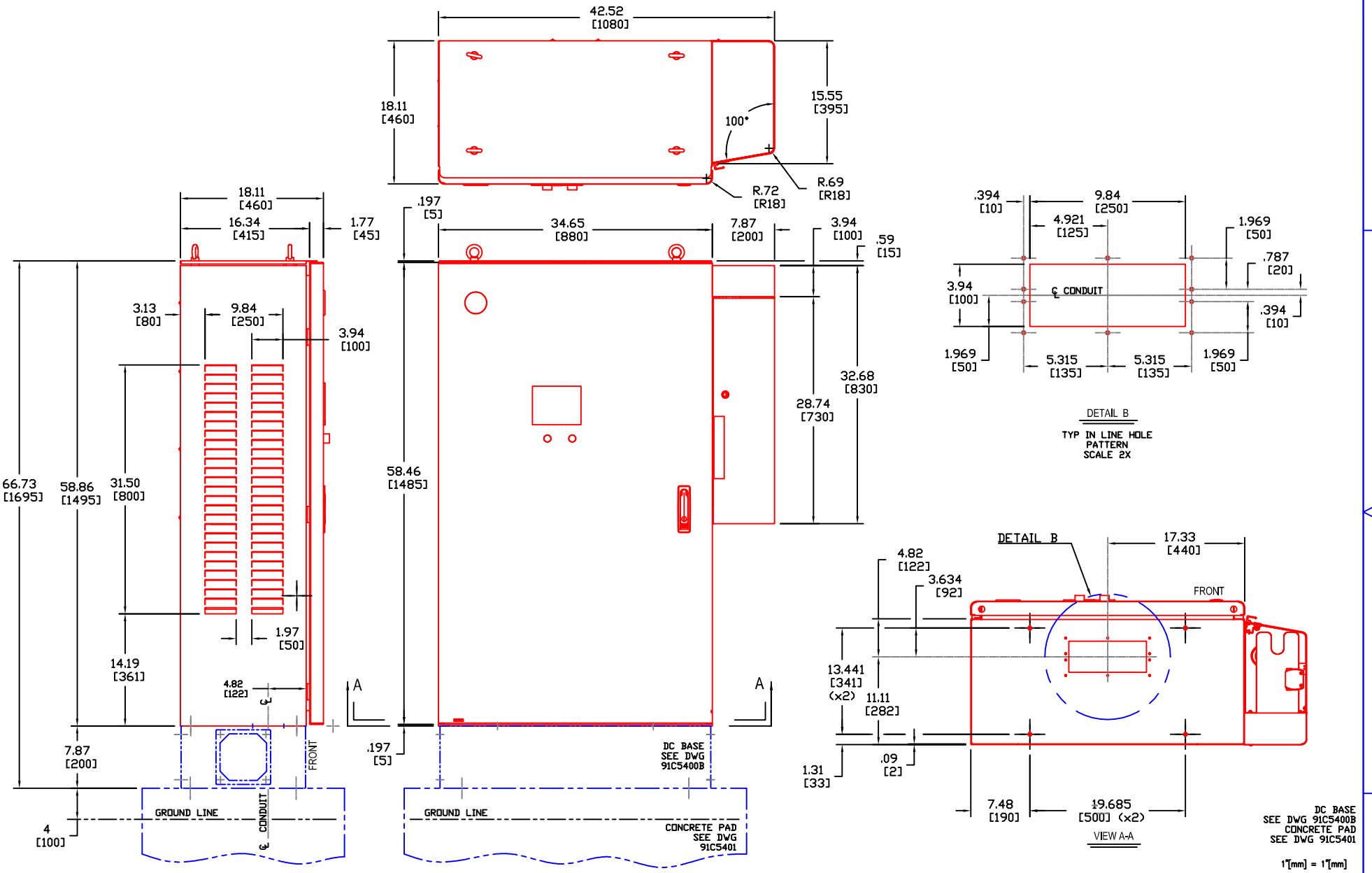
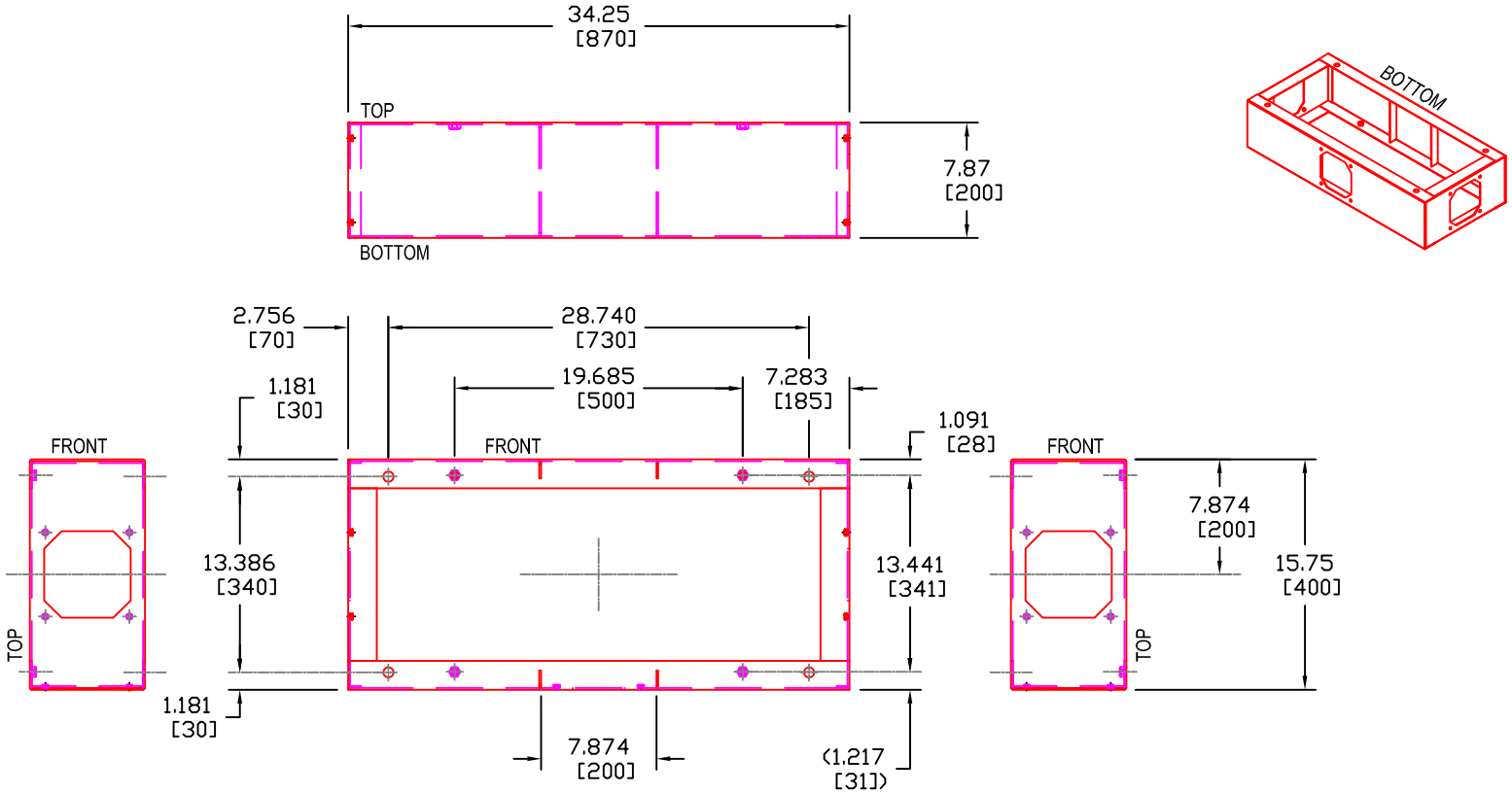


REVISION: ECN057156	UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES	DRAFTER/DESIGNER: KFRANTZ DATE: 6/7/11	EATON CORPORATION – CONFIDENTIAL AND PROPRIETARY
	ONE PLACE DEC ±0.1 TWO PLACE DEC ±0.02 THREE PLACE DEC ±0.005 ANGLES ±0.5 VOLTAGE ±5% RESISTANCE ±10% AMPERAGE ±2% FORCE,TORQUE,SPEED ±10% TIME ±1% TEMPERATURE ±3°C/±5°F	APPD: XX DATE: 6/27/11	NOTICE TO PERSONS RECEIVING THIS DOCUMENT AND/OR TECHNICAL INFORMATION: THIS DOCUMENT, INCLUDING THE DRAWING AND INFORMATION CONTAINED THEREIN, IS CONFIDENTIAL AND IS THE EXCLUSIVE PROPERTY OF EATON CORPORATION, AND IS MERELY ON LOAN AND SUBJECT TO RECALL BY EATON AT ANY TIME. BY TAKING POSSESSION OF THIS DOCUMENT, THE RECIPIENT ACKNOWLEDGES AND AGREES THAT THIS DOCUMENT CANNOT BE USED IN ANY MANNER ADVERSE TO THE INTERESTS OF EATON AND THAT NO PORTION OF THIS DOCUMENT MAY BE COPIED OR OTHERWISE REPRODUCED WITHOUT THE PRIOR WRITTEN CONSENT OF EATON. IN THE CASE OF CONFLICTING CONTRACTUAL PROVISIONS, THIS NOTICE SHALL GOVERN THE STATUS OF THIS DOCUMENT.
	DIMENSIONS TO BE INTERPRETED IN ACCORDANCE WITH ASME Y14.5M–1994	APPD: DATE:	
	XXXXXX SYMBOL DEFINITIONS PER DRAWING XXXXXX	ENGR REF:	TITLE: POWER-R-STATION EVSE QUICK DC ENCLOSURE OUTLINE
	THIRD ANGLE PROJECTION	NEXT ASSY:	
		TOOL REF:	SIZE: C FILENAME: DWG NO: 91C5400A
		DSPEC:	SCALE: 1 = 1 PARTS LIST: PRODUCT: SHEET NO: 1 OF 2 REV:

EAD_ACAD_FRMC1
REV. 06/04/08



REF:
DC ENCLOSURE
DWG 91C5400A
CONCRETE PAD
DWG 91C4501

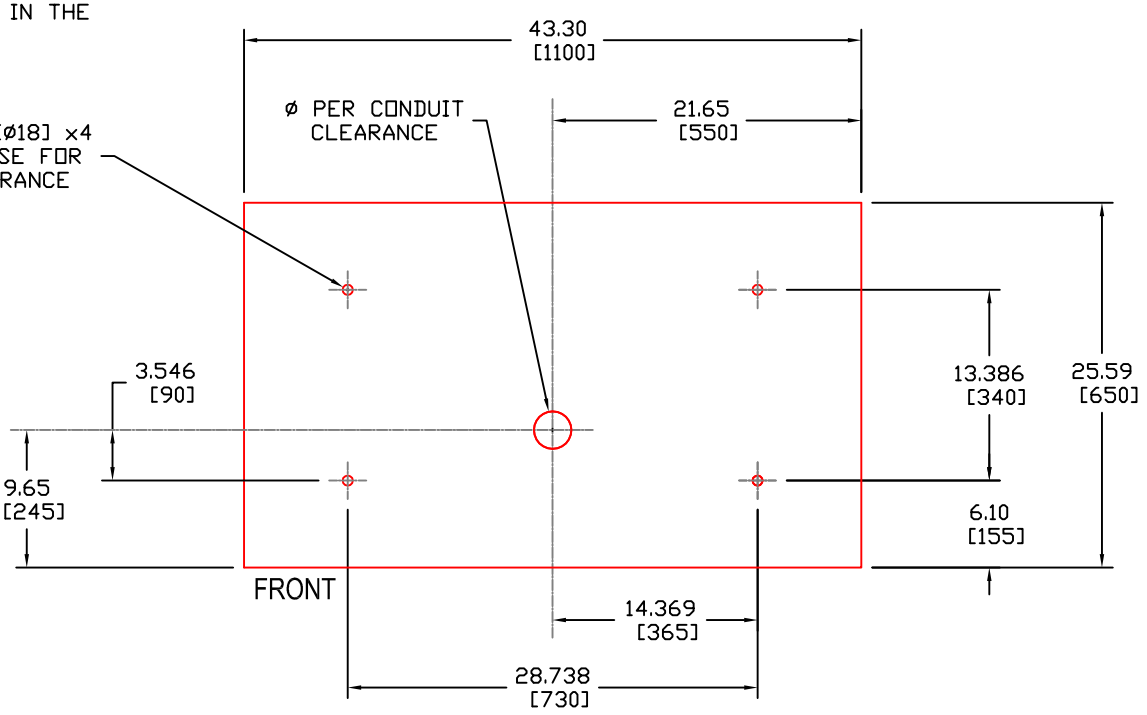
1"[mm] = 1"[mm]

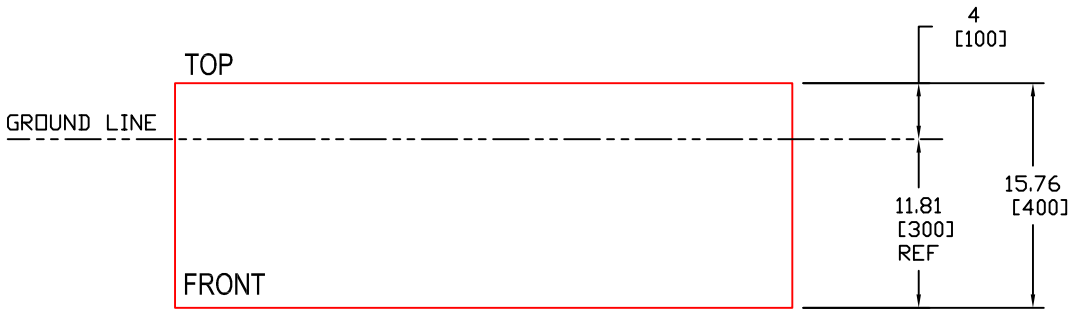
ALL REV. NOTES & SYMBOL REFERENCES ARE LISTED ON SHEET 1

SIZE	FILENAME	DWG. NO.	REV.
C	91C5400B	91C5400B	1
SUBTITLE		SHEET NO.	
DC BASE		2 OF 2	

EAD_ACAD_FRMC2
REV. 06/04/08

USE (4) M12 CONCRETE ANCHOR BOLTS AT LEAST 130mm IN DEPTH IN THE BASE CONCRETE.





IN LINE HOLE PATTERN

REF DC ENCLOSURE
DWG 91C5400

1"[mm] = .125"[mm]

REVISION HISTORY

1	ECN057153 LABELED FRONT FOR CLARITY
2	

DIMENSIONS TO BE INTERPRETED IN ACCORDANCE WITH ASME Y14.5M - 1994

DRAFTER: K.FRANTZ	DATE: 6/27/2011	MODEL FILENAME: QUICK DC PAD	MODEL REV: 1
ENGINEER: J.WHITE	DATE: 6/27/11	ENGINEERING CHANGE NOTICE NO.	
MFG. ENG.	DATE	UNLESS SPECIFIED TOLERANCES PER	
NEXT ASSY		TITLE: POW-R-STATION EVSE QUICK DC CONCRETE PAD	THIRD ANGLE PROJECTION
TOOL REF.		C	
REFERENCE		SCALE: 1 = .125	PROJECT NO.
SHOP/GENERAL ORDER NO.		TITLE BLOCK REV - 4	PRODUCT
		DWG NO. 91C5401	PARTS LIST
		SHEET 1 OF 1	REV 2

TP1 Amount Payable – General

1.1 Subject to any other provisions of the contract, Her Majesty shall pay the Contractor, at the times and in the manner hereinafter set out, the amount by which

1.1.1 the aggregate of the amounts described in TP2 exceeds

1.1.2 the aggregate of the amounts described in TP3

and the Contractor shall accept that amount as payment in full satisfaction for everything furnished and done by him in respect of the work to which the payment relates.

TP2 Amounts Payable to the Contractor

2.1 The amounts referred to in TP1.1.1 are the aggregate of

2.1.1 the amounts referred to in the Articles of Agreement, and

2.1.2 the amounts, if any, that are payable to the Contractor pursuant to the General Conditions.

TP3 Amounts Payable to Her Majesty

3.1 The amounts referred to in TP1.1.2 are the aggregate of the amounts, in any, that the Contractor is liable to pay Her Majesty pursuant to the contract.

3.2 When making any payments to the Contractor, the failure of Her Majesty to deduct an amount referred to in TP3.1 from an amount referred to in TP2 shall not be constitute a waiver of the right to do so, or an admission of lack of entitlement to do so in any subsequent payment to the Contractor.

TP4 Time of Payment

4.1 In these Terms of Payment

4.1.1 The "payment period" means a period of 30 consecutive days or such other longer period as is agreed between the Contractor and the Departmental Representative.

4.1.2 An amount is "due and payable" when it is due and payable by Her Majesty to the Contractor according to TP4.4, TP4.7 or TP4.10.

4.1.3 An amount is overdue when it is unpaid on the first day following the day upon which it is due and payable.

4.1.4 The "date of payment" means the date of the negotiable instrument of an amount due and payable by the Receiver General for Canada and given for payment.

4.1.5 The "Bank Rate" means the discount rate of interest set by the Bank of Canada in effect at the opening of business on the date of payment.

4.2 The Contractor shall, on the expiration of a payment period, deliver to the Departmental Representative in respect of that payment period a written progress claim that fully describes any part of the work that has been completed, and any material that was delivered to the work site but not incorporated into the work during that payment period.

4.3 The Departmental Representative shall, not later than ten days after receipt by him of a progress claim referred to in TP4.2,

4.3.1 inspect the part of the work and the material described in the progress claim; and

4.3.2 issue a progress report, a copy of which the Departmental Representative will give to the Contractor, that indicates the value of the part of the work and the material described in the progress claim that, in the opinion of the Departmental Representative,

4.3.2.1 is in accordance with the contract, and

4.3.2.2 was not included in any other progress report relating to the contract.

4.4 Subject to TP1 and TP4.5 Her Majesty shall, not later than 30 days after receipt by the Departmental Representative of a progress claim referred to in TP4.2, pay the Contractor

4.4.1 an amount that is equal to 95% of the value that is indicated in the progress report referred to in TP4.3.2 if a labour and material payment bond has been furnished by the Contractor, or

4.4.2 an amount that is equal to 90% of the value that is indicated in the progress report referred to in TP4.3.2 if a labour and material payment bond has not been furnished by the Contractor.

4.5 It is a condition precedent to Her Majesty's obligation under TP4.4 that the Contractor has made and delivered to the Departmental Representative,

4.5.1 a statutory declaration described in TP4.6 in respect of a progress claim referred to in TP4.2,

4.5.2 in the case of the Contractor's first progress claim, a construction schedule in accordance with the relevant sections of the Specifications, and

4.5.3 if the requirement for a schedule is specified, an update of the said schedule at the times identified in the relevant sections of the Specifications.

4.6 A statutory declaration referred to in TP4.5 shall contain a deposition by the Contractor that

4.6.1 up to the date of the Contractor's progress claim, the Contractor has complied with all his lawful obligations with respect to the Labour Conditions; and

4.6.2 up to the date of the Contractor's immediately preceding progress claim, all lawful obligations of the Contractor to subcontractors and suppliers of material in respect of the

work under the contract have been fully discharged.

4.7 Subject to TP1 and TP4.8, Her Majesty shall, not later than 30 days after the date of issue of an Interim Certificate of Completion referred to in GC44.2, pay the Contractor the amount referred to in TP1 less the aggregate of

4.7.1 the sum of all payments that were made pursuant to TP4.4;

4.7.2 an amount that is equal to the Departmental Representative's estimate of the cost to Her Majesty or rectifying defects described in the Interim Certificate of Completion; and

4.7.3 an amount that is equal to the Departmental Representative's estimate of the cost to Her Majesty of completing the parts of the work described in the Interim Certificate of Completion other than the defects referred to in TP4.7.2.

4.8 It is a condition precedent to Her Majesty's obligation under TP4.7 that the Contractor has made and delivered to the Departmental Representative,

4.8.1 a statutory declaration described in TP4.9 in respect of an Interim Certificate of Completion referred to in GC44.2, and

4.8.2 if so specified in the relevant sections of the Specifications, and update of the construction schedule referred to in TP4.5.2 and the updated schedule shall, in addition to the specified requirements, clearly show a detailed timetable that is acceptable to the Departmental Representative for the completion of any unfinished work and the correction of all defects.

4.9 A statutory declaration referred to in TP4.8 shall contain a deposition by the contractor that up to the date of the Interim Certificate of Completion the Contractor has

4.9.1 complied with all of the Contractor's lawful obligations with respect to the Labour Conditions;

4.9.2 discharged all of the Contractor's lawful obligations to the subcontractors and suppliers of material in respect of the work under the contract; and

4.9.3 discharged the Contractor's lawful obligations referred to in GC14.6.

4.10 Subject to TP1 and TP4.11, Her Majesty shall, not later than 60 days after the date of issue of a Final Certificate of Completion referred to in GC44.1, pay the Contractor the amount referred to in TP1 less the aggregate of

4.10.1 the sum of all payments that were made pursuant to TP4.4; and

4.10.2 the sum of all payments that were made pursuant to TP4.7.

4.11 It is a condition precedent to Her Majesty's obligation under TP4.10 that the Contractor has made and delivered a statutory declaration described in TP4.12 to the Departmental Representative.

4.12 A statutory declaration referred to in TP4.11 shall, in addition to the depositions described in TP4.9, contain a deposition by the Contractor that all of the Contractor's lawful obligations and any lawful claims against the Contractor that arose out of the performance of the contract have been discharged and satisfied.

TP5 Progress Report and Payment Thereunder Not Binding on Her Majesty

5.1 Neither a progress report referred to in TP4.3 nor any payment made by Her Majesty pursuant to these Terms of Payment shall be construed as an admission by Her Majesty that the work, material or any part thereof is complete, is satisfactory or is in accordance with the contract.

TP6 Delay in Making Payment

6.1 Nothwithstanding GC7 any delay by Her Majesty in making any payment when it is due pursuant to these Terms of Payment shall not be a breach of the contract by Her Majesty.

6.2 Her Majesty shall pay, without demand from the Contractor, simple interest at the Bank Rate plus 1 -1/4 per centum on any amount which is overdue pursuant to TP4.1.3, and the interest shall apply from and include the day such amount became overdue until the day prior to the date of payment except that

6.2.1 interest shall not be payable or paid unless the amount referred to in TP6.2 has been overdue for more that 15 days following

6.2.1.1 the date the said amount became due and payable, or

6.2.1.2 the receipt by the Departmental Representative of the Statutory Declaration referred to in TP4.5, TP4.8 or TP4.11,

whichever is the later, and

6.6.2 interest shall not be payable or paid on overdue advance payments if any.

TP7 Right of Set-off

7.1 Without limiting any right of set-off or deduction given or implied by law or elsewhere in the contract, Her Majesty may set off any amount payable to Her Majesty by the Contractor under this contract or under any current contract against any amount payable to the Contractor under this contract.

7.2 For the purposes of TP7.1, "current contract" means a contract between Her Majesty and the Contractor

7.2.1 under which the Contractor has an undischarged obligation to perform or supply work, labour or material, or

7.2.2 in respect of which Her Majesty has, since the date of which the Articles of Agreement were made, exercised any right to take the work that is the subject of the contract out of the Contractor's hands.

TP8 Payment in Event of Termination

8.1 If the contract is terminated pursuant to GC41, Her Majesty shall pay the Contractor any amount that is lawfully due and payable to the Contractor as soon as is practicable under the circumstances.

TP9 Interest on Settled Claims

9.1 Her Majesty shall pay to the Contractor simple interest on the amount of a settled claim at an average Bank Rate plus 1 ¼ per centum from the date the settled claim was outstanding until the day prior to the date of payment.

9.2 For the purposes of TP9.1,

9.2.1 a claim is deemed to have been settled when an agreement in writing is signed by the Departmental Representative and the Contractor setting out the amount of the claim to be paid by Her Majesty and the items or work for which the said amount is to be paid.

9.2.2 an "average Bank Rate" means the discount rate of interest set by the Bank of Canada in effect at the end of each calendar month averaged over the period the settled claim was outstanding.

9.2.3 a settled claim is deemed to be outstanding from the day immediately following the date the said claim would have been due and payable under the contract had it not been disputed.

9.3 For the purposes of TP9 a claim means a disputed amount subject to negotiation between Her Majesty and the Contractor under the contract.

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GC1 Interpretation

1.1 In the contract

1.1.1 where reference is made to a part of the contract by means of numbers preceded by letters, the reference shall be construed to be a reference to the particular part of the contract that is identified by that combination of letters and numbers and to any other part of the contract referred to therein;

1.1.2 "contract" means the contract document referred to in the Articles of Agreement;

1.1.3 "contract security" means any security given by the Contractor to Her Majesty in accordance with the contract;

1.1.4 "Departmental Representative" means the officer or employee or Her Majesty who is designated pursuant to the Articles of Agreement and includes a person specially authorized by him to perform, on his behalf, any of his functions under the contract and is so designated in writing to the Contractor;

1.1.5 "material" includes all commodities, articles and things required to be furnished by or for the Contractor under the contract for incorporation into the work;

1.1.6 "Minister" includes a person acting for, or if the office is vacant, in place of the Minister and his successors in the office, and his or their lawful deputy and any of his or their representatives appointed for the purposes of the contract;

1.1.7 "person" includes, unless the context otherwise requires, a partnership, proprietorship, firm, joint venture, consortium and a corporation;

1.1.8 "plant" includes all animals, tools, implements, machinery, vehicles, buildings, structures, equipment and commodities, articles and things other than material, that are necessary for the due performance of the contract;

1.1.9 "subcontractor' means a person to whom the Contractor has, subject to GC4, subcontracted the whole or any part of the work;

1.1.10 "superintendant" means the employee of the Contractor who is designated by the Contractor to act pursuant to GC19;

1.1.11 "work includes, subject only to any express stipulation in the contract to the contrary, everything that is necessary to be done, furnished or delivered by the Contractor to perform the contract.

1.2 The headings in the contract documents, other than in the Plans and Specifications, form no part of the contract but are inserted for convenience of reference only.

1.3 In interpreting the contract, in the event of discrepancies or conflicts between anything in the Plans and Specifications and the General Conditions, the General Conditions govern.

1.4 In interpreting the Plans and Specifications, in the event of discrepancies or conflicts between

1.4.1 the Plans and Specifications, the Specifications govern;

1.4.2 the Plans, the Plans drawn with the largest scale govern; and

1.4.3 figured dimensions and scaled dimensions, the figured dimensions govern.

GC2 Successors and Assigns

2.1 The contract shall inure to the benefit of and be binding upon the parties hereto and their lawful heirs, executors, administrators, successors and assigns.

GC3 Assignment of Contract

3.1 The contract may not be assigned by the Contractor, either in whole or in part, without the written consent of the Minister.

GC4 Subcontracting by Contractor

4.1 Subject to this General Condition, the Contractor may subcontract any part of the work.

4.2 The Contractor shall notify the Departmental Representative in writing of his intention to subcontract.

4.3 A notification referred to in GC4.2 shall identify the part of the work, and the subcontractor with whom it is intended to subcontract.

4.4 The Departmental Representative may object to the intended subcontracting by notifying the Contractor in writing within six days of receipt by the Departmental Representative of a notification referred to in GC4.2.

4.5 If the Departmental Representative objects to a subcontracting pursuant to GC4.4, the Contractor shall not enter into the intended subcontract.

4.6 The contractor shall not, without the written consent of the Departmental Representative, change a subcontractor who has been engaged by him in accordance with this General Condition.

4.7 Every subcontract entered into by the Contractor shall adopt all of the terms and conditions of ths contract that are of general application.

4.8 Neither a subcontracting nor the Departmental Representative's consent to a subcontracting by the Contractor shall be construed to relieve the Contractor from any obligation under the contract or to impose any liability upon Her Majesty.

GC5 Amendments

5.1 No amendment or change in any of the provisions of the contract shall have any force or effect until it is reduced to writing.

GC6 No Implied Obligations

6.1 No implied terms or obligations of any kind by or on behalf of Her Majesty shall arise from anything in the contract and the express covenants and agreements therein contained and made by Her Majesty are the only covenants and agreements upon which any rights against Her Majesty are to be founded.

6.2 The contract supersedes all communications, negotiations and agreements, either written or oral, relating to the work that were made prior to the date of the contract.

GC7 Time of Essence

7.1 Time is of the essence of the contract.

GC8 Indemnification by Contractor

8.1 The Contractor shall indemnify and save Her Majesty harmless from and against all claims, demand, losses, costs, damages, actions, suits, or proceedings by whomever made, brought or prosecuted and in any manner based upon, arising out of, related to, occasioned by or attributable to the activities of the Contractor, his servants, agents, subcontractors and sub-subcontractors in performing the work including an infringement or an alleged infringement of a patent of invention or any other kind of intellectual property.

8.2 For the purpose of GC8.1, "activities" includes any act improperly carried out, any omission to carry out an act and any delay in carrying out an act.

GC9 Indemnification by Her Majesty

9.1 Her Majesty shall, subject to the Crown Liability Act, the Patent Act, and any other law that affects Her Majesty's rights, powers, privileges or obligations, indemnify and save the Contractor harmless from and against all claims, demands, losses, costs, damage, actions, suits or proceedings arising out of his activities under the contract that are directly attributable to

9.1.1 lack of or a defect in Her Majesty's title to the work site whether real or alleged; or

9.1.2 an infringement or an alleged infringement by the Contractor of any patent of invention or any other kind of intellectual property occurring while the Contractor was performing any act for the purposes of the contract employing a model, plan or design or any other thing related to the work that was supplied by Her Majesty to the Contractor.

GC10 Members of House of Commons Not to Benefit

10.1 As required by the Parliament of Canada Act, it is an express condition of the contract that no member of the House of Commons shall be admitted to any share of part of the contract or to any benefit arising therefrom.

GC11 Notices

11.1 Any notice, consent, order, decision, direction or other communication, other than a notice referred to in GC11.4, that may be given to the Contractor pursuant to the contract may be given in any manner.

11.2 Any notice, consent, order, decision, direction or other communication required to be given in writing, to any party pursuant to the contract shall, subject to GC11.4, be deemed to have been effectively given

11.2.1 to the Contractor, if delivered personally to the Contractor or the Contractor's superintendent, or forwarded by mail, telex or facsimile to the Contractor at the address set out in A4.1, or

11.2.2 to Her Majesty, if delivered personally to the Departmental Representative, or forwarded by mail, telex or facsimile to the Departmental Representative at the address set out in A1.2.1.

11.3 Any such notice, consent, order, decision, direction or other communication given in accordance with GC11.2 shall be deemed to have been received by either party

11.3.1 if delivered personally, on the day that it was delivered,

11.3.2 if forwarded by mail, on the earlier of the day it was received and the sixth day after it was mailed, and

11.3.3 if forwarded by telex or facsimile, 24 hours after it was transmitted.

11.4 A notice given under GC38.1.1, GC40 and GC41, if delivered personally, shall be delivered to the Contractor if the Contractor is doing business as sole proprietor or, if the Contractor is a partnership or corporation, to an officer thereof.

GC12 Material, Plant and Real Property Supplied by Her Majesty

12.1 Subject to GC12.2, the Contractor is liable to Her Majesty for any loss of or damage to material, plant or real property that is supplied or placed in the care, custody and control of the Contractor by Her Majesty for use in connection with the contract, whether or not that loss or damage is attributable to causes beyond the Contractor's control.

12.2 The Contractor is not liable to Her Majesty for any loss or damage to material, plant or real property referred to in GC12.1 if that loss or damage results from and is directly attributable to reasonable wear and tear.

12.3 The Contractor shall not use any material, plant or real property referred to in GC12.1 except for

the purpose of performing this contract.

12.4 When the Contractor fails to make good any loss or damage for which he is liable under GC12.1 within a reasonable time after being required to do so by the Departmental Representative, the Departmental Representative may cause the loss or damage to be made good at the Contractor's expense, and the Contractor shall thereupon be liable to Her Majesty for the cost thereof and shall, on demand, pay to Her Majesty an amount equal to that cost.

12.5 The Contractor shall keep such records of all material, plant and real property referred to in GC12.1 as the Departmental Representative from time to time requires and shall satisfy the Departmental Representative, when requested, that such material, plant and real property are at the place and in the condition which they ought to be.

GC13 Material, Plant and Real Property Become Property of Her Majesty

13.1 Subject to GC14.7 all material and plant and the interest of the Contractor in all real property, licenses, powers and privileges purchased, used or consumed by the Contractor for the contract shall, after the time of their purchase, use or consumption be the property of Her Majesty for the purposes of the work and they shall continue to be the property of Her Majesty.

13.1.1 in the case of material, until the Departmental Representative indicates that he is satisfied that it will not be required for the work, and

13.1.2 in the case of plant, real property, licenses, powers and privileges, until the Departmental Representative indicates that he is satisfied that the interest vested in Her Majesty therein is no longer required for the purposes of the work.

13.2 Material or plant that is the property of Her Majesty by virtue of GC13.1 shall not be taken away from the work site or used or disposed of except for the purposes of the work without the written consent of the Departmental Representative.

13.3 Her Majesty is not liable for loss of or damage from any cause to the material or plant referred to in GC13.1 and the Contractor is liable for such loss or damage notwithstanding that the material or plant is the property of Her Majesty.

GC14 Permits and Taxes Payable

14.1 The Contractor shall, within 30 days after the date of the contract, tender to a municipal authority an amount equal to all fees and charges that would be lawfully payable to that municipal authority in respect of building permits as if the work were being performed for a person other than Her Majesty.

14.2 Within 10 days of making a tender pursuant to GC14.1, the Contractor shall notify the Departmental Representative of his action and of the amount tendered and whether or not the municipal authority has accepted that amount.

14.3 If the municipal authority does not accept the amount tendered pursuant to GC14.1 the Contractor shall pay that amount to Her Majesty within 6 days after the time stipulated in GC14.2.

14.4 For the purposes of GC14.1 to GC14.3 "municipal authority" means any authority that would have jurisdiction respecting permission to perform the work if the owner were not Her Majesty.

14.5 Notwithstanding the residency of the Contractor, the Contractor shall pay any applicable tax arising from or related to the performance of the work under the contract.

14.6 In accordance with the Statutory Declaration referred to in TP4.9, a Contractor who has neither residence nor place of business in the province in which work under the contract is being performed shall provide Her Majesty with proof of registration with the provincial sales tax authorities in the said province.

14.7 For the purpose of the payment of any applicable tax or the furnishing of security for the payment of any applicable tax arising from or related to the performance of the work under the contract, the Contractor shall, notwithstanding the fact that all material, plant and interest of the Contractor in all real property, licenses, powers and privileges, have become the property of Her Majesty after the time of purchase, be liable, as a user or consumer, for the payment or for the furnishing of security for the payment of any applicable tax payable, at the time of the use or consumption of that material, plant or interest of the Contractor in accordance with the relevant legislation.

GC15 Performance of Work under Direction of Departmental Representative

15.1 The Contractor shall

15.1.1 permit the Departmental Representative to have access to the work and its site at all times during the performance of the contract;

15.1.2 furnish the Departmental Representative with such information respecting the performance of the contract as he may require; and

15.1.3 give the Departmental Representative every possible assistance to enable the Departmental Representative to carry out his duty to see that the work is performed in accordance with the contract and to carry out any other duties and exercise any powers specially imposed or conferred on the Departmental Representative under the contract.

CG16 Cooperation with Other Contractors

16.1 Where, in the opinion of the Departmental Representative, it is necessary that other contractors or workers with or without plant and material, be sent onto the work or its site, the Contractor shall, to the satisfaction of the Departmental Representative, allow them access and cooperate with them in the carrying out of their duties and obligation.

16.2 If

16.2.1 the sending onto the work or its site of other contractors or workers pursuant to GC16.1 could not have been reasonably foreseen or anticipated by the Contractor when entering into the contract, and

16.2.2 the Contractor incurs, in the opinion of the Departmental Representative, extra expense in complying with GC16.1, and

16.2.3 The Contractor has given the Departmental Representative written notice of his claim for the extra expense referred to in GC16.2.2 within 30 days of the date that the other contractors or workers were sent onto the work or its site,

Her Majesty shall pay the Contractor the cost, calculated in accordance with GC48 to GC50, of the extra labour, plant and material that was necessarily incurred.

GC17 Examination of Work

17.1 If, at any time after the commencement of the work but prior to the expiry of the warranty or guarantee period, the Departmental Representative has reason to believe that the work or any part thereof has not been performed in accordance with the contract, the Departmental Representative may have that work examined by an expert of his choice.

17.2 If, as a result of an examination of the work referred to in GC17.1, it is established that the work was not performed in accordance with the contract, then, in addition to and without limiting or otherwise affecting any of Her Majesty's rights and remedies under the contract either at law or in equity, the Contractor shall pay Her Majesty, on demand, all reasonable costs and expenses that were incurred by Her Majesty in having that examination performed.

GC18 Clearing of Site

18.1 The Contractor shall maintain the work and its site in a tidy condition and free from the accumulation of waste material and debris, in accordance with any directions of the Departmental Representative.

18.2 Before the issue of an interim certificate referred to in GC44.2, the Contractor shall remove all the plant and material not required for the performance of the remaining work, and all waste material and other debris, and shall cause the work and its site to be clean and suitable for occupancy by Her Majesty's servants, unless otherwise stipulated in the contract.

18.3 Before the issue of a final certificate referred to in GC44.1, the Contractor, shall remove from the work and its site all of the surplus plant and material and any waste material and other debris.

18.4 The Contractor's obligations described in GC18.1 to GC18.3 do not extend to waste material and other debris caused by Her Majesty's servants or contractors and workers referred to in GC16.1.

GC19 Contractor's Superintendent

19.1 The Contractor shall, forthwith upon the award of the contract, designate a superintendent.

19.2 The Contractor shall forthwith notify the Departmental Representative of the name, address and telephone number of a superintendent designate pursuant to GC19.1.

19.3 A superintendent designated pursuant to GC19.1 shall be in full charge of the operations of the Contractor in the performance of the work and is authorized to accept any notice, consent, order, direction, decision or other communication on behalf of the Contractor that may be given to the superintendent under the contract.

19.4 The Contractor shall, until the work has been completed, keep a competent superintendent at the work site during working hours.

19.5 The Contractor shall, upon the request of the Departmental Representative, remove any superintendent who, in the opinion of the Departmental Representative, is incompetent or has been conducting himself improperly and shall forthwith designate another superintendent who is acceptable to the Departmental Representative.

19.6 Subject to GC19.5, the Contractor shall not substitute a superintendent without the written consent of the Departmental Representative.

19.7 A breach by the Contractor of GC19.6 entitles the Departmental Representative to refuse to issue any certificate referred to in GC44 until the superintendent has returned to the work site or another superintendent who is acceptable to the Departmental Representative has been substituted.

GC20 National Security

20.1 If the Minister is of the opinion that the work is of a class or kind that involves the national security, he may order the Contractor

20.1.1 to provide him with any information concerning persons employed or to be employed by him for purposes of the contract; and

20.1.2 to remove any person from the work and its site if, in the opinion of the Minister, that person may be a risk to the national security.

20.2 The Contractor shall, in all contracts with persons who are to be employed in the performance of the contract, make provision for his performance of any obligation that may be imposed upon him under GC19 to GC21.

20.3 The Contractor shall comply with an order of the Minister under GC20.1

GC21 Unsuitable Workers

21.1 The Contractor shall, upon the request of the Departmental Representative, remove any person employed by him for purposes of the contract who, in the opinion of the Departmental Representative, is incompetent or has conducted himself improperly, and the Contractor shall not permit a person who has been removed to return to the work site.

GC22 Increased or Decreased Costs

22.1 The amount set out in the Articles of Agreement shall not be increased or decreased by reason of any increase or decrease in the cost of the work that is brought about by an increase or decrease in the cost of labour, plant or material or any wage adjustment arising pursuant to the Labour Conditions.

22.2 Notwithstanding GC22.1 and GC35, an amount set out in the Articles of Agreement shall be adjusted in the manner provided in GC22.3, if any change in a tax imposed under the Excise Act, the Excise Tax Act, the Old Age Security Act, the Customs Act, the Customs Tariff or any provincial sales tax legislation imposing a retail sales tax on the purchase of tangible personal property incorporated into Real Property

22.2.1 occurs after the date of the submission by the Contractor of his tender for the contract,

22.2.2 applies to material, and

22.2.3 affects the cost to the Contractor of that material.

22.3 If a change referred to in GC22.2 occurs, the appropriate amount set out in the Articles of Agreement shall be increased or decreased by an amount equal to the amount that is established by an examination of the relevant records of the Contractor referred to in GC51 to be the increase or decrease in the cost incurred that is directly attributable to that change.

22.4 For the purpose of GC22.2, where a tax is changed after the date of submission of the tender but public notice of the change has been given by the Minister of Finance before that date, the change shall be deemed to have occurred before the date of submission of the tender.

GC23 Canadian Labour and Material

23.1 The Contractor shall use Canadian labour and material in the performance of the work to the full extent to which they are procurable, consistent with proper economy and expeditious carrying out of the work.

23.2 Subject to GC23.1, the Contractor shall, in the performance of the work, employ labour from the locality where the work is being performed to the extent to which it is available, and shall use the offices of the Canada Employment Centres for the recruitment of workers wherever practicable.

23.3 Subject to GC23.1 and GC23.2, the Contractor shall, in the performance of the work, employ a reasonable proportion of persons who have been on active service with the armed forces of Canada and have been honourably discharged therefrom.

GC24 Protection of Work and Documents

24.1 The Contractor shall guard or otherwise protect the work and its site, and protect the contract, specifications, plans, drawings, information, material, plant and real property, whether or not they are supplied by Her Majesty to the Contractor, against loss or damage from any cause, and he shall not use, issue, disclose or dispose of them without the written consent of the Minister, except as may be essential for the performance of the work.

24.2 If any document or information given or disclosed to the Contractor is assigned a security rating by the person who gave or disclosed it, the Contractor shall take all measures directed by the Departmental Representative to be taken to ensure the maintenance of the degree of security that is ascribed to that rating.

24.3 The Contractor shall provide all facilities necessary for the purpose of maintaining security, and shall assist any person authorized by the Minister to inspect or to take security measures in respect of the work and its site.

24.4 The Departmental Representative may direct the Contractor to do such things and to perform such additional work as the Departmental Representative considers reasonable and necessary to ensure compliance with or to remedy a breach of GC24.1 to GC24.3.

GC25 Public Ceremonies and Signs

25.1 The Contractor shall not permit any public ceremony in connection with the work without the prior consent of the Minister.

25.2 The Contractor shall not erect or permit the erection of any sign or advertising on the work or its site without the prior consent of the Departmental Representative.

GC26 Precautions against Damage, Infringement of Rights, Fire, and Other Hazards

26.1 The Contractor shall, at his own expense, do whatever is necessary to ensure that

26.1.1 no person, property, right, easement or privilege is injured, damaged or infringed by reasons of the Contractor's activities in performing the contract;

26.1.2 pedestrian and other traffic on any public or private road or waterway is not unduly impeded, interrupted or endangered by the performance or existence of the work or plant;

26.1.3 fire hazards in or about the work or its site are eliminated and, subject to any direction that may be given by the Departmental Representative, any fire is promptly extinguished;

26.1.4 the health and safety of all persons employed in the performance of the work is not endangered by the method or means of its performance;

26.1.5 adequate medical services are available to all persons employed on the work or its site at all times during the performance of the work;

26.1.6 adequate sanitation measures are taken in respect of the work and its site; and

26.1.7 all stakes, buoys and marks placed on the work or its site by or under the authority of the Departmental Representative are protected and are not removed, defaced, altered or destroyed.

26.2 The Departmental Representative may direct the Contractor to do such things and to perform such additional work as the Departmental Representative considers reasonable and necessary to ensure

compliance with or to remedy a breach of GC26.1.

26.3 The Contractor shall, at his own expense, comply with a direction of the Departmental Representative made under GC26.2.

GC27 Insurance

27.1 The Contractor shall, at his own expense, obtain and maintain insurance contracts in respect of the work and shall provide evidence thereof to the Departmental Representative in accordance with the requirements of the Insurance Conditions "E".

27.2 The insurance contracts referred to in GC27.1 shall

27.2.1 be in a form, of the nature, in the amounts, for the periods and containing the terms and conditions specified in Insurance Conditions "E", and

27.2.2 provide for the payment of claims under such insurance contracts in accordance with GC28.

GC28 Insurance Proceeds

28.1 In the case of a claim payable under a Builders Risk/Installation (All Risks) insurance contract maintained by the Contractor pursuant to GC27, the proceeds of the claim shall be paid directly to Her Majesty, and

28.1.1 the monies so paid shall be held by Her Majesty for the purposes of the contract, or

28.1.2 if Her Majesty elects, shall be retained by Her Majesty, in which event they vest in Her Majesty absolutely.

28.2 In the case of a claim payable under a General Liability insurance contract maintained by the Contractor pursuant to GC27, the proceeds of the claim shall be paid by the insurer directly to the claimant.

28.3 If an election is made pursuant to GC28.1, the Minister may cause an audit to be made of the accounts of the Contractor and of Her Majesty in respect of the part of the work that was lost, damaged or destroyed for the purpose of establishing the difference, if any, between

28.3.1 the aggregate of the amount of the loss or damage suffered or sustained by Her Majesty, including any cost incurred in respect of the clearing and cleaning of the work and its site and any other amount that is payable by the Contractor to Her Majesty under the contract, minus any monies retained pursuant to GC28.12, and

28.3.2 the aggregate of the amounts payable by Her Majesty to the Contractor pursuant to the contract up to the date of the loss or damage.

28.4 A difference that is established pursuant to GC28.3 shall be paid forthwith by the party who is determined by the audit to be the debtor to the party who is determined by the audit to be the

creditor.

28.5 When payment of a deficiency has been made pursuant to GC28.4, all rights and obligations of Her Majesty and the Contractor under the contract shall, with respect only to the part of the work that was the subject of the audit referred to in GC28.3, be deemed to have been expended and discharged.

28.6 If an election is not made pursuant to GC28.1.2 the Contractor shall, subject to GC28.7, clear and clean the work and its site and restore and replace the part of the work that was lost, damaged or destroyed at his own expense as if that part of the work had not yet been performed.

28.7 When the Contractor clears and cleans the work and its site and restores and replaces the work referred to in GC 28.6, Her Majesty shall pay him out of the monies referred to in GC28.1 so far as they will thereunto extend.

28.8 Subject to GC28.7, payment by Her Majesty pursuant to GC28.7 shall be made in accordance with the contract but the amount of each payment shall be 100% of the amount claimed notwithstanding TP4.4.1 and TP4.4.2.

GC29 Contract Security

29.1 The Contractor shall obtain and deliver contract security to the Departmental Representative in accordance with the provisions of the Contract Security Conditions.

29.2 If the whole or a part of the contract security referred to in GC29.1 is in the form of a security deposit, it shall be held and disposed of in accordance with GC43 and GC45.

29.3 If a part of the contract security referred to in GC29.1 is in the form of a labour and material payment bond, the Contractor shall post a copy of that bond on the work site.

GC30 Changes in the Work

30.1 Subject o GC5, the Departmental Representative may, at any time before he issues his Final Certificate of Completion,

30.1.1 order work or material in addition to that provided for in the Plans and Specifications; and

30.1.2 delete or change the dimensions, character, quantity, quality, description, location or position of the whole or any part of the work or material proved for in the Plans and Specifications or in any order made pursuant to GC30.1.1,

if that additional work or material, deletion, or change is, in his opinion, consistent with the general intent of the original contract.

30.2 The Contractor shall perform the work in accordance with such orders, deletions and changes that are made by the Departmental Representative pursuant to GC30.1 from time to time as if they had appeared in and been part of the Plans and Specifications.

30.3 The Departmental Representative shall determine whether or not anything done or omitted by the Contractor pursuant to an order, deletion or change referred to in GC30.1 increased or decreased the cost of the work to the Contractor.

30.4 If the Departmental Representative determines pursuant to GC30.3 that the cost of the work to the Contractor has been increased, Her Majesty shall pay the Contractor the increased cost that the Contractor necessarily incurred for the additional work calculated in accordance with GC49 or GC50.

30.5 If the Departmental Representative determines pursuant to GC303.3 that the cost of the work to the Contractor has been decreased, Her Majesty shall reduce the amount payable to the Contractor under the contract by an amount equal to the decrease in the cost caused by the deletion or change referred to in GC30.1.2 and calculated in accordance with GC49.

30.6 GC30.3 to GC30.5 are applicable only to a contract or a portion of a contract for which a Fixed Price Arrangement is stipulated in the contract.

30.7 An order, deletion or change referred to in GC30.1 shall be in writing, signed by the Departmental Representative and given to the Contractor in accordance with GC11.

GC31 Interpretation of Contract by Departmental Representative

31.1 If, ar any time before the Departmental Representative has issued a Final Certificate of Completion referred to in GC44.1, any question arises between the parties about whether anything has been done as required by the contract or about what the Contractor is required by the contract to do, and, in particular but without limiting the generality of the foregoing, about

31.1.1 the meaning of anything in the Plans and Specification,

31.1.2 the meaning to be given to the Plans and Specifications in case of any error therein, omission therefrom, or obscurity or discrepancy in their working or intention,

31.1.3 whether or not the quality or quantity of any material or workmanship supplied or proposed to be supplied by the Contractor meets the requirements of the contract,

31.1.4 whether or not the labour, plant or material provided by the Contractor for performing the work and carrying out the contract are adequate to ensure that the work will be performed in accordance with the contract and that the contract will be carried out in accordance with its terms,

31.1.5 what quantity of any kind of work has been completed by the Contractor, or

31.1.6 the timing and scheduling of the various phases of the performance of the work,

the question shall be decided by the Departmental Representative whose decision shall be final and conclusive in respect of the work.

31.2 The Contractor shall perform the work in accordance with any decisions of the Departmental

Representative that are made under GC31.1 and in accordance with any consequential directions given by the Departmental Representative.

GC32 Warranty and Rectification of Defects in Work

32.1 Without restricting any warranty or guarantee implied or imposed by law or contained in the contract documents, the Contractor shall, at his own expense,

32.1.1 rectify and make good any defect or fault that appears in the work or comes to the attention of the Minister with respect to those parts of the work accepted in connection with the Interim Certificate of Completion referred to GC44.2 within 12 months from the date of the Interim Certificate of Completion;

32.1.2 rectify and make good any defect or fault that appears in or comes to the attention of the Minister in connection with those parts of the work described in the Interim Certificate of Completion referred to in GC44.2 within 12 months from the date of the Final Certificate of Completion referred to in GC44.1.

32.2 The Departmental Representative may direct the Contractor to rectify and make good any defect or fault referred to in GC32.1 or covered by any other expressed or implied warranty or guarantee.

32.3 A direction referred to in GC32.2 shall be in writing, may include a stipulation in respect of the time within which a defect or fault is required to be rectified and made good by the Contractor, and shall be given to the Contractor in accordance with GC11.

32.4 The Contractor shall rectify and make good any defect or fault described in a direction given pursuant to GC32.2 within the time stipulated therein.

GC33 Non-Compliance by Contractor

33.1 If the Contractor fails to comply with any decision or direction given by the Departmental Representative pursuant to GC18, GC24, GC26, GC31 or GC32, the Departmental Representative may employ such methods as he deems advisable to do that which the Contractor failed to do.

33.2 The Contractor shall, on demand, pay Her Majesty an amount that is equal to the aggregate of all cost, expenses and damage incurred or sustained by Her Majesty by reason of the Contractor's failure to comply with any decision or direction referred to in GC33.1, including the cost of any methods employed by the Departmental Representative pursuant to GC33.1.

GC34 Protesting Departmental Representative's Decisions

34.1 The Contractor may, within ten days after the communication to him of any decision or direction referred to in GC30.3 or GC33.1, protest that decision or direction.

34.2 A protest referred to in GC34.1 shall be in writing, contain full reasons for the protest, be signed

by the Contractor and be given to Her Majesty by delivery to the Departmental Representative.

34.3 If the Contractor gives a protest pursuant to GC34.2, any compliance by the Contractor with the decision or direction that was protested shall not be construed as an admission by the Contractor of the correctness of that decision or direction, or prevent the Contractor from taking whatever action he considers appropriate in the circumstances.

34.4 The giving of a protest by the Contractor pursuant to GC34.2 shall not relieve him from complying with the decision or direction that is the subject of the protest.

34.5 Subject to GC34.6, the Contractor shall take any action referred to in GC34.3 within three months after the date that a Final Certificate of Completion is issued under GC44.1 and not afterwards.

34.6 The Contractor shall take any action referred to in GC34.3 resulting from a direction under GC32 within three months after the expiry of a warranty or guarantee period and not afterwards.

34.7 Subject to GC34.8, if Her Majesty determines that the Contractor's protest is justified, Her Majesty shall pay the Contractor the cost of the additional labour, plant and material necessarily incurred by the Contractor in carrying out the protested decision or direction.

34.8 Costs referred to in GC34.7 shall be calculated in accordance with GC48 to GC50.

GC35 Changes in Soil Conditions and Neglect or Delay by Her Majesty

35.1 Subject to GC35.2 no payment, other than a payment that is expressly stipulated in the contract, shall be made by Her Majesty to the Contractor for any extra expense or any loss or damage incurred or sustained by the Contractor.

35.2 If the Contractor incurs or sustains any extra expense or any loss or damage that is directly attributable to

35.2.1 a substantial difference between the information relating to soil conditions at the work site that is contained in the Plans and Specifications or other documents supplied to the Contractor for his use in preparing his tender or a reasonable assumption of fact based thereon made by the Contractor, and the actual soil conditions encountered by the Contractor at the work site during the performance of the contract, or

35.2.2 any neglect or delay that occurs after the date of the contract on the part of Her Majesty in providing any information or in doing any act that the contract either expressly requires Her Majesty to do or that would ordinarily be done by an owner in accordance with the usage of the trade,

he shall, within ten days of the date the actual soil conditions described in GC35.2.1 were encountered or the neglect or delay described in GC35.2.2 occurred, give the Departmental Representative written notice of his intention to claim for that extra expense or that loss or damage.

35.3 When the Contractor has given a notice referred to in GC35.2, he shall give the Departmental Representative a written claim for extra expense or loss or damage within 30 days of the date that

a Final Certificate of Completion referred to in GC44.1 is issued and not afterwards.

35.4 A written claim referred to in GC35.3 shall contain a sufficient description of the facts and circumstances of the occurrence that is the subject of the claim to enable the Departmental Representative to determine whether or not the claim is justified and the Contractor shall supply such further and other information for that purpose as the Departmental Representative requires from time to time.

35.5 If the Departmental Representative determines that a claim referred to in GC35.3 is justified, Her Majesty shall make an extra payment to the Contractor in an amount that is calculated in accordance with GC47 to GC50.

35.6 If, in the opinion of the Departmental Representative, an occurrence described in GC35.2.1 results in a savings of expenditure by the Contractor in performing the contract, the amount set out in the Articles of Agreement shall, subject to GC35.7, be reduced by an amount that is equal to the saving.

35.7 The amount of the saving referred to in GC35.6 shall be determined in accordance with GC47 to GC49.

35.8 If the Contractor fails to give a notice referred to in GC35.2 and a claim referred to in GC35.3 within the times stipulated, an extra payment shall not be made to him in respect of the occurrence.

GC36 Extension of Time

36.1 Subject to GC36.2, the Departmental Representative may, on the application of the Contractor made before the day fixed by the Articles of Agreement for completion of the work or before any other date previously fixed under this General Condition, extend the time for its completion by fixing a new date if, in the opinion of the Departmental Representative, causes beyond the control of the Contractor have delayed its completion.

36.2 An application referred to in GC36.1 shall be accompanied by the written consent of the bonding company whose bond forms part of the contract security.

GC37 Assessments and Damages for Late Completion

37.1 For the purposes of this General Condition

37.1.1 the work shall be deemed to be completed on the date that an Interim Certificate of Completion referred to in GC44.2 is issued, and

37.1.2 "period of delay" means the number of days commencing on the day fixed by the Articles of Agreement for completion of the work and ending on the day immediately preceding the day on which the work is completed but does not include any day within a period of extension granted pursuant to GC36.1, and any other day on which, in the opinion of the Departmental Representative, completion of the work was delayed for reasons beyond the control of the Contractor.

37.2 If the Contractor does not complete the work by the day fixed for its completion by the Articles of Agreement but completes it thereafter, the Contractor shall pay Her Majesty an amount equal to the aggregate of

37.2.1 all salaries, wages and travelling expenses incurred by Her Majesty in respect of persons overseeing the performance of the work during the period of delay;

37.2.2 the cost incurred by Her Majesty as a result of the inability to use the completed work for the period of delay; and

37.2.3 all other expenses and damages incurred or sustained by Her Majesty during the period of delay as a result of the work not being completed by the day fixed for its completion.

37.3 The Minister may waive the right of Her Majesty to the whole or any part of the amount payable by the Contractor pursuant to GC37.2 I , in the opinion of the Minister, it is in the public interest to do so.

GC38 Taking the Work Out of the Contractor's Hands

38.1 The Minister may, at his sole discretion, by giving a notice in writing to the Contractor in accordance with GC11, take all or any part of the work out of the Contractor's hands, and may employ such means as he sees fit to have the work completed if the Contractor

38.1.1 Has not, within six days of the Minister or the Departmental Representative giving notice to the Contractor in writing in accordance with GC11, remedied any delay in the commencement or any default in the diligent performance of the work to the satisfaction of the Departmental Representative;

38.1.2 has defaulted in the completion of any part of the work within the time fixed for its completion by the contract;

38.1.3 has become insolvent;

38.1.4 has committed an act of bankruptcy;

38.1.5 has abandoned the work;

38.1.6 has made an assignment of the contract without the consent required by GC3.1; or

38.1.7 has otherwise failed to observe or perform any of the provisions of the contract.

38.2 If the whole or any part of the work is taken out of the Contractor's hands pursuant to GC38.1,

38.2.1 the Contractor's right to any further payment that is due or accruing due under the contract is, subject only to GC38.4, extinguished, and

38.2.2 the Contractor is liable to pay Her Majesty, upon demand, an amount that is equal to the amount of all loss and damage incurred or sustained by Her Majesty in respect of the

Contractor's failure to complete the work.

38.3 If the whole or any part of the work that is taken out of the Contractor's hands pursuant to GC38.1 is completed by Her Majesty, the Departmental Representative shall determine the amount, if any, of the holdback or a progress claim that had accrued and was due prior to the date on which the work was taken out of the Contractor's hands and that is not required for the purposes of having the work performed or of compensating Her Majesty for any other loss or damage incurred or sustained by reason of the Contractor's default.

38.4 Her Majesty may pay the Contractor the amount determined not to be required pursuant to GC38.3.

GC39 Effect of Taking the Work Out of the Contractor's Hands

39.1 The taking of the work or any part thereof out of the Contractor's hands pursuant to GC38 does not operate so as to relieve or discharge him from any obligation under the contract or imposed upon him by law except the obligation to complete the performance of that part of the work that was taken out of his hands.

39.2 If the work or any part thereof is taken out of the Contractor's hands pursuant to GC38, all plant and material and the interest of the Contractor is all real property, licenses, powers and privileges acquired, used or provided by the Contractor under the contract shall continue to be the property of Her Majesty without compensation to the Contractor.

39.3 When the Departmental Representative certifies that any plant, material, or any interest of the Contractor referred to in GC39.2 is no longer required for the purposes of the work, or that it is not in the interest of Her Majesty to retain that plant, material or interest, it shall revert to the Contractor.

G40 Suspension of Work by Minister

40.1 The Minister may, when in his opinion it is in the public interest to do so, require the Contractor to suspend performance of the work either for a specified or an unspecified period by giving a notice of suspension in wiring to the Contractor in accordance with GC11.

40.2 When a notice referred to in GC40.1 is received by the Contractor in accordance with GC11, he shall suspend all operations in respect of the work except those that, in the opinion of the Departmental Representative, are necessary for the care and preservation of the work, plant and material.

40.3 The Contractor shall not, during a period of suspension, remove any part of the work, plant or material from its site without the consent of the Departmental Representative.

40.4 If a period of suspension is 30 days or less, the Contractor shall, upon the expiration of that period, resume the performance of the work and he is entitled to be paid the extra cost, calculated in accordance with GC48 to GC50, of any labour, plant and material necessarily incurred by him as a result of the suspension.

40.5 If, upon the expiration of a period of suspension of more than 30 days, the Minister and the Contractor agree that the performance of the work will be continued by the Contractor, the Contractor shall resume performance of the work subject to any terms and conditions agreed upon by the Minister and the Contractor.

40.6 If, upon the expiration of a period of suspension of more than 30 days, the Minister and the Contractor do not agree that performance of the work will be continued by the Contractor or upon the terms and conditions under which the Contractor will continue the work, the notice of suspension shall be deemed to be a notice of termination pursuant to GC41.

GC41 Termination of Contract

41.1 The Minister may terminate the contract at any time by giving a notice of termination in writing to the Contractor in accordance with GC11.

41.2 When a notice referred to in GC41.1 is received by the Contractor in accordance with GC11, he shall, subject to any conditions stipulated in the notice, forthwith cease all operations in performance of the contract.

41.3 If the contract is terminated pursuant to GC41.1, Her Majesty shall pay the Contractor, subject to GC41.4, an amount equal to

41.3.1 the cost to the contractor of all labour, plant and material supplied by him under the contract up to the date of termination in respect of a contract or part thereof for which a Unit Price Arrangement is stipulated in the contract, or

41.3.2 the lesser of

41.3.2.1 an amount, calculated in accordance with the Terms and Payment, that would have been payable to the Contractor had he completed the work, and

41.3.2.2 an amount that is determined to be due to the Contractor pursuant to GC49 in respect of a contract or part thereof for which a Fixed Price Arrangement is stipulated in the contract

less the aggregate of all amounts that were paid to the Contractor by Her Majesty and all amounts that are due to Her Majesty from the Contractor pursuant to the contract.

41.4 If Her Majesty and the Contractor are unable to agree about an amount referred to in GC41.3 that amount shall be determined by the method referred to in GC50.

GC42 Claims Against and Obligations of the Contractor or Subcontractor

42.1 Her Majesty may, in order to discharge lawful obligations of and satisfy claims against the Contractor or a subcontractor arising out of the performance of the contract, pay any amount that is due and payable to the Contractor pursuant to the contract directly to the obligees of and the claimants against the Contractor or the subcontractor but such amount if any, as is paid by Her Majesty, shall not exceed that amount which the Contractor would have been obliged to pay to

such claimant had the provisions of the Provincial or Territorial lien legislation, or, in the Province of Quebec, the law relating to privileges, been applicable to the work. Any such claimant need not comply with the provisions of such legislation setting out the steps by way of notice, registration or otherwise as might have been necessary to preserve or perfect any claim for lien or privilege which claimant might have had;

42.2 Her Majesty will not make any payment as described in GC42.1 unless and until that claimant shall have delivered to Her Majesty:

42.2.1 a binding and enforceable Judgment or Order of a court of competent jurisdiction setting forth such amount as would have been payable by the Contractor to the claimant pursuant to the provisions of the applicable Provincial or Territorial lien legislation, or, in the Province of Quebec, the law relating to privileges, had such legislation been applicable to the work; or

42.2.2 a final and enforceable award of an arbitrator setting forth such amount as would have been payable by the Contractor to the claimant pursuant to the provisions of the applicable Provincial or Territorial lien legislation, or, in the Province of Quebec, the law relating to privileges, had such legislation been applicable to the work; or

42.2.3 the consent of the Contractor authorizing a payment.

For the purposes of determining the entitlement of a claimant pursuant to GC42.2.1 and GC42.2.2, the notice required by GC42.8 shall be deemed to replace the registration or provision of notice after the performance of work as required by any applicable legislation and no claim shall be deemed to have expired, become void or unenforceable by reason of the claimant not commencing any action within the time prescribed by any applicable legislation.

42.3 The Contractor shall, by the execution of his contract, be deemed to have consented to submit to binding arbitration at the request of any claimant those questions that need be answered to establish the entitlement of the claimant to payment pursuant to the provisions of GC42.1 and such arbitration shall have as parties to it any subcontractor to whom the claimant supplied material, performed work or rented equipment should such subcontractor wish to be adjoined and the Crown shall not be a party to such arbitration and, subject to any agreement between the Contractor and the claimant to the contrary, the arbitration shall be conducted in accordance with the Provincial or Territorial legislation governing arbitration applicable in the Province or Territory in which the work is located.

42.4 A payment made pursuant to GC42.1 is, to the extent of the payment, a discharge of Her Majesty's liability to the Contractor under the contract and may be deducted from any amount payable to the Contractor under the contract.

42.5 To the extent that the circumstances of the work being performed for Her Majesty permit, the Contractor shall comply with all laws in force in the Province or Territory where the work is being performed relating to payment period, mandatory holdbacks, and creation and enforcement of mechanics' liens, builders' liens or similar legislation or in the Province of Quebec, the law relating to privileges.

42.6 The Contractor shall discharge all his lawful obligations and shall satisfy all lawful claims against him arising out of the performance of the work at least as often as the contract requires Her

Majesty to pay the Contractor.

42.7 The Contractor shall, whenever requested to do so by the Departmental Representative, make a statutory declaration deposing to the existence and condition of any obligations and claims referred to in GC42.6.

42.8 GC42.1 shall only apply to claims and obligations

42.8.1 the notification of which has been received by the Departmental Representative in writing before payment is made to the Contractor pursuant to TP4.10 and within 120 days of the date on which the claimant

42.8.1.1 should have been paid in full under the claimant's contract with the Contractor or subcontractor where the claim is for money that was lawfully required to be held back from the claimant; or

42.8.1.2 performed the last of the services, work or labour, or furnished the last of the material pursuant to the claimant's contract with the Contractor or subcontractor where the claim is not for money referred to in GC42.8.1.1, and

42.8.2 the proceedings to determine the right to payment of which, pursuant to GC42.2. shall have commenced within one year from the date that the notice referred to in GC42.8.1 was received by the Departmental Representative, and

the notification required by GC42.8.1 shall set forth the amount claimed to be owing and the person who by contract is primarily liable.

42.9 Her Majesty may, upon receipt of a notice of claim under GC42.8.1, withhold from any amount that is due and payable to the Contractor pursuant to the contract the full amount of the claim or any portion thereof.

42.10 The Departmental Representative shall notify the Contractor in writing of receipt of any claim referred to in GC42.8.1 and of the intention of Her Majesty to withhold funds pursuant to GC42.9 and the Contractor may, at any time thereafter and until payment is made to the claimant, be entitled to post, with Her Majesty, security in a form acceptable to Her Majesty in an amount equal to the value of the claim, the notice of which is received by the Departmental Representative and upon receipt of such security Her Majesty shall release to the Contractor any funds which would be otherwise payable to the Contractor, that were withheld pursuant to the provisions of GC42.9 in respect of the claim of any claimant for whom the security stands.

GC43 Security Deposit – Forfeiture or Return

43.1 If

43.1.1 the work is taken out of the Contractor's hands pursuant to GC38,

43.1.2 the contract is terminated pursuant to GC41, or

43.1.3 the Contractor is in breach of or in default under the contract,

Her Majesty may convert the security deposit, if any, to Her own use.

43.2 If Her Majesty converts the contract security pursuant to GC43.1, the amount realized shall be deemed to be an amount due from Her Majesty to the Contractor under the contract.

43.3 Any balance of an amount referred to in GC43.2 that remains after payment of all losses, damage and claims of Her Majesty and others shall be paid by Her Majesty to the Contractor if, in the opinion of the Departmental Representative, it is not required for the purposes of the contract.

GC44 Departmental Representative's Certificates

44.1 On the date that

44.1.1 the work has been completed, and

44.1.2 the Contractor has complied with the contract and all orders and directions made pursuant thereto,

both to the satisfaction of the Departmental Representative, the Departmental Representative shall issue a Final Certificate of Completion to the Contractor.

44.2 If the Departmental Representative is satisfied that the work is substantially complete he shall, at any time before he issues a certificate referred to in GC44.1, issue an Interim Certificate of Completion to the Contractor, and

44.2.1 for the purposes of GC44.2 the work will be considered to be substantially complete,

44.2.1.1 when the work under the contract or a substantial part thereof is, in the opinion of the Departmental Representative, ready for use by Her Majesty or is being used for the purpose intended; and

44.2.1.2 when the work remaining to be done under the contract is, in the opinion of the Departmental Representative, capable of completion or correction at accost of not more that

44.2.1.2.1 -3% of the first $500,000, and

44.2.1.2.2 -2% of the next $500,000, and

44.2.1.2.3 -1% of the balance

of the value of the contract at the time this cost is calculated.

44.3 For the sole purpose of GC44.2.1.2, where the work or a substantial part thereof is ready for use or is being used for the purposes intended and the remainder of the work or a part thereof cannot be completed by the time specified in A2.1, or as amended pursuant to GC36, for reasons beyond the control of the Contractor or where the Departmental Representative and the Contractor agree not to complete a part of the work within the specified time, the cost of that part of the work

which was either beyond the control of the Contractor to complete or the Departmental Representative and the Contractor have agreed not to complete by the time specified shall be deducted from the value of the contract referred to GC44.2.1.2 and the said cost shall not form part of the cost of the work remaining to be done in determining substantial completion.

44.4 An Interim Certificate of Completion referred to in GC44.2 shall describe the parts of the work not completed to the satisfaction of the Departmental Representative and all things that must be done by the Contractor

44.4.1 before a Final Certificate of Completion referred to in GC44.1 will be issued, and

44.4.2 before the 12-month period referred to in GC32.1.2 shall commence for the said parts and all the said things.

44.5 The Departmental Representative may, in addition to the parts of the work described in an Interim Certificate of Completion referred to in GC44.2, require the Contractor to rectify any other parts of the work not completed to his satisfaction and to do any other things that are necessary for the satisfactory completion of the work.

44.6 If the contract or a part thereof is subject to a Unit Price Arrangement, the Departmental Representative shall measure and record the quantities of labour, plant and material, performed, used and supplied by the Contractor in performing the work and shall, at the request of the Contractor, inform him of those measurements.

44.7 The Contractor shall assist and co-operate with the Departmental Representative in the performance of his duties referred to in GC44.6 and shall be entitled to inspect any record made by the Departmental Representative pursuant to GC44.6.

44.8 After the Departmental Representative has issued a Final Certificate of Completion referred to in GC44.1, he shall, if GC44.6 applies, issue a Final Certificate of Measurement.

44.9 A Final Certificate of Measurement referred to in GC44.8 shall

44.9.1 contain the aggregate of all measurements of quantities referred to in GC44.6, and

44.9.2 be binding upon and conclusive between Her Majesty and the Contractor as to the quantities referred to therein.

GC45 Return of Security Deposit

45.1 After an Interim Certificate of Completion referred to in GC44.2 has been issued, Her Majesty shall, if the Contractor is not in breach of or in default under the contract, return to the Contractor all or any part of the security deposit that, in the opinion of the Departmental Representative, is not required for the purposes of the contract.

45.2 After a Final Certificate of Completion referred to in GC44.1 has been issued, Her Majesty shall return to the Contractor the remainder of any security deposit unless the contract stipulates otherwise.

45.3 If the security deposit was paid into the Consolidated Revenue Fund of Canada, Her Majesty shall pay interest thereon to the Contractor at a rate established from time to time pursuant to section 21(2) of the Financial Administration Act.

GC46 Clarification of Terms in GC47 to GC50

46.1 For the purposes of GC47 to GC50,

46.1.1 "Unit Price Table" means the table set out in the Articles of Agreement, and

46.1.2 "plant" does not include tools customarily provided by a tradesman in practicing his trade.

GC47 Additions or Amendments to Unit Price Table

47.1 Where a Unit Price Arrangement applies to the contract or a part thereof the Departmental Representative and the Contractor may, by an agreement in writing,

47.1.1 add classes of labour or material, and units of measurement, prices per unit and estimated quantities to the Unit Price Table if any labour, plant or material that is to be included in the Final Certificate of Measurement referred to in GC44.8 is not included in any class of labour, plant or material set out in the Unit Price Table; or

47.1.2 subject to GC47.2 and GC47.3, amend a price set out in the Unit Price Table for any class of labour, plant or material included therein if the Final Certificate of Measurement referred to in GC44.8 shows or is expected to show that the total quantity of that class of labour, plant or material actually performed, used or supplied by the Contractor in performing the work is

47.1.2.1 less than 85% of that estimated total quantity, or

47.1.2.2 in excess of 115% of that estimated total quantity.

47.2 In no event shall the total cost of an item set out in the Unit Price Table that has been amended pursuant to GC47.1.2.1 exceed the amount that would have been payable to the Contractor had the estimated total quantity actually been performed, used or supplied.

47.3 An amendment that is made necessary by GC47.1.2.2 shall apply only to the quantities that are in excess of 115%.

47.4 If the Departmental Representative and the Contractor do not agree as contemplated in GC47.1, the Departmental Representative shall determine the class and the unit of measurement of the labour, plant or material and, subject to GC47.2 and GC47.3, the price per unit therefore shall be determined in accordance with GC50.

GC48 Determination of Cost – Unit Price Table

48.1 Whenever, for the purposes of the contract, it is necessary to determine the cost of labour, plant or material, it shall be determined by multiplying the quantity of that labour, plant or material expressed in the unit set out in column 3 of the Unit Price Table by the price of that unit set out in column 5 of the Unit Price Table.

GC49 Determination of Cost – Negotiation

49.1 If the method described in GC48 cannot be used because the labour, plant or material is of a kind or class that is not set out in the Unit Price Table, the cost of that labour, plant or material for the purposes of the contract shall be the amount agreed upon from time to time by the Contractor and the Departmental Representative.

49.2 For the purposes of GC49.1, the Contractor shall submit to the Departmental Representative any necessary cost information requested by the Departmental Representative in respect of the labour, plant and material referred to in GC49.1

GC50 Determination of Cost – Failing Negotiation

50.1 If the methods described in GC47, GC48 or GC49 fail for any reason to achieve a determination of the cost of labour, plant and material for the purposes referred to therein, that cost shall be equal to the aggregate of

50.1.1 all reasonable and proper amounts actually expended or legally payable by the Contractor in respect of the labour, plant and material that falls within one of the classes of expenditure described in GC50.2 that are directly attributable to the performance of the contract,

50.1.2 an allowance for profit and all other expenditures or costs, including overhead, general administration cost, financing and interest charges, and every other cost, charge and expenses, but not including those referred to in GC50.1.1 or GC50.1.3 or a class referred to in GC50.2, in an amount that is equal to 10% of the sum of the expenses referred to in GC50.1.1, and

50.1.3 interest on the cost determined under GC50.1.1 and GC50.1.2, which interest shall be calculated in accordance with TP9,

provide that the total cost of an item set out n the Unit Price Table that is subject to the provisions of GC47.1.2.1 does not exceed the amount that would have been payable to the Contractor had the estimated total quantity of the said item actually be performed, used or supplied.

50.2 For purposes of GC50.1.1 the classes of expenditure that may be taken into account in determining the cost of labour, plant and material are,

50.2.1 payments to subcontractors;

50.2.2 wages, salaries and travelling expenses of employees of the Contractor while they are actually and properly engaged on the work, other than wages, salaries, bonuses, living

and travelling expenses of personnel of the Contractor generally employed at the head office or at a general office of the Contractor unless they are engaged at the work site with the approval of the Departmental Representative,

50.2.3 assessments payable under any statutory authority relating to workmen's compensation, unemployment insurance, pension plan or holidays with pay;

50.2.4 rent that is paid for plant or an amount equivalent of the said rent if the plant is owned by the Contractor that is necessary for and used in the performance of the work, if the rent of the equivalent amount is reasonable and use of that plant has been approved by the Departmental Representative;

50.2.5 payments for maintaining and operating plant necessary for and used in the performance of the work, and payments for effecting such repairs thereto as, in the opinion of the Departmental Representative, are necessary to the proper performance of the contract other than payments for any repairs to the plant arising out of defects existing before its allocation to the work;

50.2.6 payments for material that is necessary for and incorporated in the work, or that is necessary for and consumed in the performance of the contract;

50.2.7 payments for preparation, delivery, handling, erection, installation, inspection protection and removal of the plant and material necessary for and used in the performance of the contract; and

50.2.8 any other payments made by the Contractor with the approval of the Departmental Representative that are necessary for the performance of the contract.

GC51 Records to be kept by Contractor

51.1 The Contractor shall

51.1.1 maintain full records of his estimated and actual cost of the work together with all tender calls, quotations, contracts, correspondence, invoices, receipts and vouchers relating thereto.

51.1.2 make all records and material referred to in GC5.1.1 available to audit and inspection by the Minister and the Deputy Receiver General for Canada or by persons acting on behalf of either of both of them, when requested;

51.1.3 allow any of the person referred to in GC51.1.2 to make copies of and to take extracts from any of the records and material referred to in GC51.1.1; and

51.1.4 furnish any person referred to in GC51.1.2 with any information he may require from time to time in connection with such records and material.

51.2 The records maintained by the Contractor pursuant to GC51.1.1 shall be kept intact by the Contractor until the expiration of two years after the date that a Final Certificate of Completion referred to in GC44.1 was issued or until the expiration of such other period of time as the

Minister may direct.

51.3 The Contractor shall cause all subcontractors and all other persons directly or indirectly controlled by or affiliated with the Contractor and all persons directly or indirectly having control of the Contractor to comply with GC51.1 and GC51.2 as if they were the Contractor.

GC52 Conflict of Interest

52.1 It is a term of this contract that no former public office holder who is not in compliance with the Conflict of Interest and Post-Employment Code for Public Office Holders shall derive a direct benefit from this contract.

GC53 Contractor Status

53.1 The Contractor shall be engaged under the contract as an independent contractor.

53.2 The Contractor and any employee of the said Contractor is not engaged by the contract as an employee, servant or agent of Her Majesty.

53.3 For the purposes of GC53.1 and GC53.2 the Contractor shall be solely responsible for any and all payments and deductions required to be made by law including those required for Canada or Quebec Pension Plans, Unemployment Insurance, Worker's Compensation or Income Tax.

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APPENDIX 'D'

Fair Wages and Hours of Labour

Labour Conditions

ANNEXE 'D'

Justes Salaires et Heures de Travail

Conditions de Travail

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01 Interpretation

In these Conditions

(a) "Act" means the Fair Wages and Hours of Labour Act;

(b) "Regulations" means the Fair Wages and Hours of Labour Regulations made pursuant to the Act;

(c) "contract" means the contract of which these Labour Conditions are part;

(d) "contracting authority" means the department of Government or a crown corporation with whom the contract is made;

(e) "contractor" means the person who has entered into the contract with the contracting authority;

(f) "regional director" means the director of a regional office of the Department of Human Resources Development or the director's designated representative;

(g) "inspector" has the meaning assigned to the term by Part III of the Canada Labour Code.

(h) "Minister" means the Minister of Labour of Canada;

(i) "persons" means those workers employed by the contractor, subcontractor or any other person doing or contracting to do the whole or any part of the work contemplated by the contract;

01 Interprétation

Dans ces conditions

a) «Loi» désigne la Loi sur les justes salaires et les heures de travail;

b) «Règlement» désigne le Règlement sur les justes salaires et les heures de travail établi en application de la Loi;

c) «contrat» désigne le contrat auquel sont annexées les présentes Conditions de travail;

d) «adjudicateur» désigne le ministère du gouvernement ou la société d'État avec lequel le contrat a été passé;

e) «entrepreneur» désigne la personne qui a passé le contrat avec l'adjudicateur;

f) «directeur régional» le responsable d'un bureau régional du ministère du Développement des resources humaines ou son représentant désigné;

g) «inspecteur» s'entend au sens de la partie III du Code canadien du travail;

h) «Ministre» désigne le ministre du Travail du Canada;

i) «personnes» désigne les travailleurs employés par l'entrepreneur, le sous-traitant ou toute autre personne exécutant ou s'engageant par contrat à exécuter la totalité ou une partie quelconque des travaux prévus dans le contrat;

02 General Fair Wage Clause

(a) All persons in the employ of the contractor, subcontractor, or any other person doing or contracting to do the whole or any part of the work contemplated by the contract, shall during the continuance of the work:

i) be paid fair wages that is, such wages as are generally accepted as current for competent workers in the district in which the work is being performed for the character or class of work in which such workers are respectively engaged; and

ii) in all cases, be paid no less than the minimum hourly rate of pay established by the Labour Program of the Department of Human Resources Development in the Fair Wage Schedules which form a part of this contract as Appendix A to these Labour Conditions; and

iii) for contracts covering work performed in the province of Quebec, be paid at least the wage rates established by that province for the purposes of the Quebec "Construction Decree".

(b) Where there is no wage rate in the schedules referred to in (a) for a particular character or class of work, the contractor shall pay wages for that character or class of work at a rate not less than the rate for an equivalent character or class of work.

(c) Where during the term of the contract, the contractor receives notice from the contracting authority of any change in wage rates, the contractor shall pay not less than the changed wage rate beginning on the first day after receipt, by the contractor, of the notice of the change in wage rates.

02 Clause générale de justes salaires

(a) Toutes les personnes employées par l'entrepreneur, le sous-traitant ou toute autre personne exécutant ou s'engageant par contrat à exécuter la totalité ou une partie quelconque des travaux prévus dans le contrat seront payées :

i) des justes salaires tant que dureront les travaux, c'est-à-dire les salaires généralement reconnus comme salaires courants pour les travailleurs qualifiés dans la région où les travaux sont exécutés, selon la nature ou la catégorie du travail auquel ces travailleurs sont respectivement affectés; et

ii) dans tous les cas, pas moins que les taux horaires minima fixés par le Programme du travail du ministère du Développement des resources humaines dans les échelles de justes salaires qui deviennent partie de ce contrat en tant qu'Annexe A de ces Conditions de travail; et

iii) pour les contrats concernant les travaux effectués dans la province de Québec, pas moins que les taux de salaires qui sont établis par cette province pour les fins du "Décret de la construction" du Québec.

(b) Lorsqu'il n'y a aucun taux prévu dans l'échelle des taux de salaires à l'égard d'un travail d'une nature ou d'une catégorie données, l'entrepreneur verse à l'employé un taux de salaire qui n'est pas inférieur à celui établi pour un travail de nature ou de catégorie équivalente.

(c) Lorsque pendant la durée du contrat, l'entrepreneur reçoit de l'adjudicateur un avis de modification à l'échelle de salaires, l'entrepreneur rémunère les employés touchés par cette modification à des taux qui ne sont pas inférieurs aux taux modifiés à compter de la journée qui suit la réception par lui, de l'avis.

03 Hours of Work

(a) The hours of work in a day and in a week of persons employed in the execution of the contract, including the hours of work in excess of which a person shall be paid overtime at a rate at least equal to one and one half times the fair wage, are the hours of work for the province in which the work is being performed as set out from time to time in an Act of that province.

(b) The daily or weekly hours of work referred to in paragraph (a) may be exceeded in accordance with the applicable provincial law.

03 Durée du travail

(a) Les heures de travail quotidiennes et hebdomadaires des personnes employées à l'exécution du contrat, notamment les heures au-delà desquelles une personne doit être rétribuée selon le tarif pour heures supplémentaires, soit au moins le juste salaire majoré de 50 pour cent, sont celles fixées et éventuellement modifiées par la législation de la province dans laquelle le travail est effectué.

(b) Les heures de travail quotidiennes ou hebdomadaires mentionnées à l'alinéa (a) peuvent être dépassées conformément à la législation provinciale applicable.

04 Labour Conditions to be Posted	04 Affichage des conditions de travail
For the information and the protection of all persons, the contractor agrees to post and keep posted, in a conspicuous place on the premises where work contemplated by the contract is being carried out or on premises occupied or used by persons engaged in carrying out such work, a copy of these Labour Conditions, and a copy of the applicable Fair Wage Schedules along with any subsequent changes.	Pour l'information et la protection de toutes les personnes, l'entrepreneur convient d'afficher et de tenir affichés, bien à la vue, à l'endroit où les travaux prévus dans le contrat sont exécutés, ou dans les locaux occupés ou fréquentés par les personnes employées à l'exécution desdits travaux, un exemplaire des présentes Conditions de travail, un exemplaire de l'échelle de justes salaires applicable et toutes modifications subséquentes.
05 The Contractor to Keep Records which are to be Kept Open for Inspection (a) The contractor agrees to keep books and records showing the names, addresses, classifications of employment and work of all workers employed under the contract, the rate of wages to be paid, the wages paid and the daily hours worked by the workers. (b) The contractor also agrees that the contractor's books, records and premises will be open at all reasonable times for inspection by an inspector. (c) The contractor also agrees to furnish the inspector and the contracting authority, on request, with such further information as is required to ascertain that the requirements of the Act, the Regulations and the contract with respect to wages, hours of work and other labour conditions have been complied with.	05 L'entrepreneur tient des dossiers pour fins d'inspection (a) L'entrepreneur convient de tenir les registres et dossiers où sont consignés le nom, l'adresse et la catégorie d'emploi et de travail de tous les travailleurs employés à des travaux exécutés en vertu du contrat, de même que le taux de salaire, le salaire payé et la durée journalière du travail pour chacun de ces travailleurs. (b) L'entrepreneur convient également à faire en sorte que ses registres, ses dossiers et ses locaux soient accessibles en tout temps opportun, pour fins d'inspection par un inspecteur. (c) L'entrepreneur convient en outre de fournir, sur demande, à l'inspecteur et à l'adjudicateur tous les autres renseignements requis pour permettre de constater qu'on a satisfait aux exigences de la Loi, des règlements et du contrat en ce qui concerne les salaires, la durée du travail et les autres conditions de travail.
06 Departmental Requirements before Payment made to Contractor (a) The contractor agrees that the contractor will not be entitled to payment of any money otherwise payable under the contract until the contractor has filed with the contracting authority in support of a claim for payment a sworn statement: (i) that the contractor has kept the books and records required by these Regulations, (ii) that there are no wages in arrears in respect of work performed under the contract, and (iii) that to the contractor's knowledge, all the conditions in the contract required by the Act and the Regulations have been complied with. (b) The contractor also agrees that, where fair wages have not been paid by the contractor to persons employed under the contract, the contracting authority shall withhold from any money otherwise payable under the contract to the contractor the amount necessary to ensure that fair wages are paid to all employees until fair wages are paid.	06 Exigences du ministère avant le versement des sommes dues à l'entrepreneur (a) L'entrepreneur convient qu'il n'aura droit au paiement d'aucune somme qui autrement devrait lui être versée en vertu du contrat tant qu'il n'aura pas déposé auprès de l'adjudicateur, à l'appui de sa réclamation de paiement, une déclaration sous serment indiquant: (i) qu'il a tenu les registres et dossiers requis par les présents règlements, (ii) qu'il n'y a pas d'arrérages de salaires à l'égard des travaux exécutés en vertu du contrat, et (iii) qu'à sa connaissance, toutes les conditions du contrat exigées par la Loi et les règlements ont été observées. (b) L'entrepreneur convient en outre que lorsqu'il n'a pas versé un juste salaire à une personne employée en vertu du contrat, l'adjudicateur sera autorisé à retenir de toute somme autrement payable à l'entrepreneur en vertu du contrat la somme requise pour assurer le paiement de justes salaires à tous les employés jusqu'à ce qu'ils aient touché leur juste salaire.

07 Authority to pay Wages in the Event of Default by the Contractor (a) The contractor agrees that where the contractor is in default of payment of fair wages to an employee, the contractor will pay the Minister the amount the contractor is in default. (b) The contractor agrees that where the contractor fails to comply with paragraph (a), the contracting authority will pay to the Receiver General, out of any money otherwise payable to the contractor, the amount for which the contractor is in default.	07 Paiement des salaires par l'adjudicateur si l'entrepreneur omet de le faire (a) L'entrepreneur convient qu'à défaut du paiement par ce dernier d'un juste salaire à un travailleur, l'entrepreneur devra verser au ministre le montant qu'il a omis de payer. (b) L'entrepreneur convient que s'il omet de se conformer au paragraphe (a), l'adjudicateur paiera au Receveur général, à même les sommes autrement payables à l'entrepreneur, le montant qu'il a omis de payer.
08 Conditions of Subcontracting The contractor and the subcontractor agree that in subcontracting any part of the work contemplated by the contract, they will place in the subcontract the conditions respecting fair wages, hours of work and other labour conditions set out in the contract and the requirements set out in Section 4. The contractor further agrees that the contractor will be responsible for carrying out these conditions in the event the subcontractor fails to carry them out.	**08 Conditions imposées à un sous-traitant** L'entrepreneur et le sous-traitant conviennent, dans l'adjudication à un sous-traitant de toute partie des travaux prévus par le contrat, d'insérer dans le sous-contrat les conditions relatives aux justes salaires, à la durée du travail et autres conditions de travail indiquées dans le contrat ainsi que les obligations énoncées à l'article 4. L'entrepreneur convient en outre qu'il sera responsable du respect de ces conditions si elles ne sont pas respectées par le sous-traitant.
09 Non-discrimination in Hiring and Employment of Labour The contractor agrees that in the hiring and employment of workers to perform any work under the contract, the contractor will not refuse to employ and will not discriminate in any manner against any person because (a) of that person's race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, disability, conviction for which a pardon has been granted, or family status; (b) of the race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, disability, conviction for which a pardon has been granted, or family status of any person having a relationship or association with that person, or (c) a complaint has been made or information has been given in respect of that person relating to an alleged failure by the contractor to comply with subparagraph (a) or (b).	09 Non-discrimination dans l'embauchage et l'emploi de main-d'oeuvre L'entrepreneur convient que dans l'embauchage et l'emploi des travailleurs aux fins de l'exécution de tout travail en vertu du contrat, l'entrepreneur ne refusera pas d'employer une personne ou d'exercer de quelque façon que ce soit des distinctions injustes à l'endroit d'une personne en raison (a) de la race, de l'origine nationale ou ethnique, de la couleur, de la religion, de l'âge, du sexe, de l'orientation sexuelle, de l'état matrimonial, de la situation de famille, de l'état de personne graciée ou d'une déficience de la personne; (b) de la race, de l'origine nationale ou ethnique, de la couleur, de la religion, de l'âge, du sexe, de l'orientation sexuelle, de l'état matrimonial, de la situation de famille, de l'état de personne graciée ou d'une déficience de toute personne ayant un lien avec elle; (c) du fait que cette personne a porté plainte ou a fourni des renseignements ou parce qu'une plainte a été portée ou des renseignements ont été fournis en son nom relativement à toute prétendue omission de la part de l'entrepreneur de se conformer aux sous-alinéas (a) ou (b).

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LABOUR CONDITIONS Appendix A
CONDITIONS DE TRAVAIL Annexe A

FAIR WAGE SCHEDULE
FOR FEDERAL CONSTRUCTION CONTRACTS

ÉCHELLE DE JUSTES SALAIRES
POUR LES CONTRATS FÉDÉRAUX DE CONSTRUCTION

Ontario – Ottawa Zone / Ontario – Zone d'Ottawa
Effective August 15, 2011 / En vigueur le 15 août 2011

Construction trades workers on the federal government construction contract listed in this appendix must be paid a regular hourly wage rate no less than the rate on this schedule for the type of work they are doing under the contract. The apprentice wage rates are included into this schedule by reference to the Ontario *Trades Qualification and Apprenticeship Act* and its Regulations. Thus, where the Regulations refer to a percentage of a corresponding journeyperson's wage for a specific occupation, that percentage shall be applied against the wages listed below.	Les travailleurs de métiers de la construction, sur un contrat fédéral de construction, doivent être payés à un taux de salaires non moindre que le taux de cette échelle pour le type de travail effectué en vertu du contrat en question. Le salaire des apprentis est inclus dans cette échelle en faisant référence à la Loi sur la qualification professionnelle et l'apprentissage des gens de métier de l'Ontario et ses Règlements. Ainsi, là où les Règlements prescrivent que le salaire d'un apprenti doit correspondre au pourcentage du salaire d'un ouvrier qualifié de la même occupation, le calcul sera effectué en utilisant les taux ci-dessous.
*Denotes a compulsory trade: a trade license or apprenticeship registration valid in Ontario is required to work in the occupation.	*Dénote un métier obligatoire : un métier qui exige une licence ou un enregistrement d'apprentissage valide en Ontario.

CLASSIFICATION OF LABOUR **CATÉGORIES DE MAIN-D'OEUVRE**	**FAIR WAGE RATE PER HOUR NOT LESS THAN** **TAUX DE JUSTE SALAIRE NON INFÉRIEUR À**
*Electricians *Electriciens	**33.19**
*Plumbers *Plombiers	**30.99**
Sprinkler System Installers Poseurs de gicleurs	**36.14**
*Pipefitters, Steamfitters *Tuyauteurs, monteurs d'appareils de chauffage	**34.57**
*Sheet Metal Workers *Toliers (ouvriers de feuilles de métal)	**31.06**
Boilermakers Chaudronnier	**33.26**
Ironworkers (except Reinforcing Ironworkers (Rebar/Rodman)) Monteurs de charpentes métalliques (sauf ferrailleurs et placeurs de tiges métalliques dans le béton)	**30.17**
Reinforcing Ironworkers (Rebar/Rodman) Placeurs de tiges métalliques dans le béton	**29.50**
Carpenters Charpentiers-menuisiers	**24.43**
Bricklayers Briqueteurs-maçons	**32.15**
Cement Finishers Finisseurs de béton ou ciment	**26.98**

Tilesetters (including terrazo, marble setters) Poseurs de carrelage (de céramique, de marbre, etc.)	**31.65**
Plasterers and Drywall Tapers Pâtriers et jointoyeurs de cloisons sèches	**29.19**
Drywall Installers, Finishers and Lathers Latteurs et poseurs de cloisons sèches, finisseurs	**31.67**
Interior System Mechanics (including steel stud) Mécaniciens de systèmes intérieurs (incluant structure d'acier)	**32.38**
Roofers Couvreurs de revêtement de toiture	**21.50**
Glaziers Vitriers	**29.20**
Insulators Calorifugeurs	**32.35**
Painters Peintres	**18.44**
Flooring Installers Poseurs de revêtements d'intérieur	**30.22**
Construction Millwrights Mécaniciens de chantier	**34.60**
*Heavy-Duty Equipment Mechanics *Mécaniciens d'équipement lourd	**23.29**
*Refrigeration and Air Conditioning Mechanics *Mécaniciens en réfrigération et climatisation	**36.65**
Elevator Constructors Constructeurs d'ascenseurs	**43.53**
*Mobile Crane Operators *Conducteurs/opérateurs de grue mobile	**33.82**
*Tower Crane Operators *Conducteurs/opérateurs de grue à tour	**34.78**
Straight Truck Drivers Conducteurs de camions unitaires	**19.45**
Road Tractor Drivers for Semi-Trailers and Trailers Conducteurs de tracteurs routiers pour semi-remorques ou remorques	**19.57**
Operators-Heavy Equipment (ex. Cranes, Graders) Conducteurs de machinerie lourdes (sauf grues, niveleuses)	**22.10**
Grader Operators Conducteurs de niveleuse (grader)	**27.47**
Asphalt Plant Operators Opérateurs de machinerie de pavage	**22.01**
Scraper Operators Conducteurs de scraper	**29.16**
Packer (road roller) Operators Conducteurs de rouleau compresseur (Packer)	**18.06**
Pressure Vessel Welder	**33.61**

Soudeur de réservoirs pour fluides sous-pression	
Traffic Accommodation/Control Persons Ouvriers chargé de diriger la circulation	**15.54**
Labourers (Except Traffic Accommodation/Control Persons) Manoeuvres (sauf ouvriers chargé de diriger la circulation)	**19.29**

Fair wage schedule prepared by:
Labour Standards and Workplace Equity Division
Labour Program, Human Resources and Skills Development Canada

Based on The National Construction Industry Wage Rate Survey (2009) conducted by the Small Business and Special Surveys Division, Statistics Canada.

L'échelle des justes salaires est préparée par :
Division des normes du travail et équité en milieu de travail
Programme du travail, Ressources humaines et Développement des compétences Canada

Basée sur l'Enquête nationale sur les taux salariaux dans le secteur de la construction (2009) faite par la Division des petites entreprises et enquêtes spéciales, Statistique Canada.

CONTRACTORS SHOULD NOTE:	L'ENTREPRENEUR DOIT NOTER :
a) that during the term of this contract, the rates listed herein may be revised in accordance with the labour conditions; and	a) que pendant la durée de ce contrat, les taux de salaires énumérés dans l'annexe peuvent être révisés en conformité avec les conditions de travail, et
b) that in carrying out any of the work contemplated by this contract, the contractor is also subject to any applicable provincial laws and regulations; and	b) que dans l'exécution de tout travail prévu par le contrat, l'entrepreneur est aussi assujetti aux lois et règlements provinciaux, et
c) overtime must be paid according to provincial legislation concerning hours of work at a rate equal to at least one and one-half times the fair wage rate; and	c) le temps supplémentaire doit être rémunéré conformément aux lois provinciales relatives aux heures de travail à un taux équivalent au moins une fois et demi le taux des justes salaires, et
d) schedule rates are 'straight' wages and do not include compensation in the form of benefits (for example, medical, dental or pension plans); and	d) les taux de l'échelle fait référence à la rémunération en salaire et ne comprennent pas la rémunération sous forme d'avantages sociaux (par exemple, les plans d'assurance médicale ou dentaire, ou les régimes de pension), et
e) in the event of a complaint under the Fair Wages and Hours of Labour Act, if the occupation of the complainant is not on the posted schedule, the Labour Program inspector will assign the most similar occupation from the schedule by comparing the national occupational classification (NOC) code and the job description that best defines the work actually done by the complainant.	e) dans le cas d'une plainte sous la Loi sur les justes salaires et les heures de travail, si le métier du plaignant ne figure pas dans l'échelle affichée, l'inspecteur du Programme du travail déterminera le métier le plus semblable dans l'échelle en comparant le code et la description de tâches de la Classification nationale des professions (CNP) qui décrivent le mieux le travail effectué par le plaignant.

FOR INFORMATION CONCERNING THESE SCHEDULES AND THE *FAIR WAGES AND HOURS OF LABOUR ACT* UNDER WHICH THEY ARE DEVELOPED, OR TO LODGE A COMPLAINT, CONTACT YOUR NEAREST LABOUR PROGRAM DISTRICT OFFICE LISTED IN THE BLUE PAGES OF YOUR TELEPHONE DIRECTORY UNDER **GOVERNMENT OF CANADA, HUMAN RESOURCES AND SKILLS DEVELOPMENT CANADA** OR CALL **1-800-OCANADA**.

POUR OBTENIR DE L'INFORMATION SUR LES ÉCHELLES ET LA *LOI SUR LES JUSTES SALAIRES ET LES HEURES DE TRAVAIL* SOUS LAQUELLE ELLES ONT ÉTÉ DÉVELOPPÉES, OU POUR DÉPOSER UNE PLAINTE, CONTACTEZ LE BUREAU LOCAL DU PROGRAMME DU TRAVAIL LE PLUS PRÈS DE CHEZ VOUS EN CHERCHANT DANS LES PAGES BLEUES DE VOTRE ANNUAIRE SOUS **GOUVERNEMENT DU CANADA, RESSOURCES HUMAINES ET DÉVELOPPEMENT DES COMPÉTENCES CANADA**. VOUS POUVEZ ÉGALEMENT TÉLÉPHONER AU **1-800-OCANADA**.

Canada

GENERAL CONDITONS

IC 1 Proof of Insurance
IC 2 Risk Management
IC 3 Payment of Deductible
IC 4 Insurance Coverage

GENERAL INSUANCE COVERAGES

GCI 1 Insured
GIC 2 Period of Insurance
GIC 3 Proof of Insurance
GIC 4 Notification

COMMERCIAL GENERAL LIABILITY

CGL 1 Scope of Policy
CGL 2 Coverages/Provisions
CGL 3 Additional Exposures
CGL 4 Insurance Proceeds
CGL 5 Deductible

BUILDER'S RISK – INSTALLATION FLOATER – ALL RISKS

BR 1 Scope of Policy
BR 2 Property Insured
BR 3 Insurance Proceeds
BR 4 Amount of Insurance
BR 5 Deductible
BR 6 Subrogation
BR 7 Exclusion Qualifications

INSURER'S CERTIFICATE OF INSURANCE

General Conditions

IC 1 Proof of Insurance
(02/12/03)

Within thirty (30) days after acceptance of the Contractor's tender, the Contractor shall, unless otherwise directed in writing by the Contracting Officer, deposit with the Contracting Officer an Insurer's Certificate of Insurance in the form displayed in this document and, if requested by the Contracting Officer, the originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the Insurance Coverage Requirements shown hereunder.

IC 2 Risk Management
(01/10/94)

The provisions of the Insurance Coverage Requirements contained hereunder are not intended to cover all of the Contractor's obligations under GC8 of the General Conditions "C" of the contract. Any additional risk management measures or additional insurance coverages the Contractor may deem necessary to fulfill its obligations under GC8 shall be at its own discretion and expense.

IC 3 Payment of Deductible
(01/10/94)

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

IC 4 Insurance Coverage
(02/12/03)

The Contractor has represented that it has in place and effect the appropriate and usual liability insurance coverage as required by these Insurance Conditions and the Contractor has warranted that it shall obtain, in a timely manner and prior to commencement of the Work, the appropriate and usual property insurance coverage as required by these Insurance Conditions and, further, that it shall maintain all required insurance policies in place and effect as required by these Insurance Conditions.

INSURANCE COVERAGE REQUIREMENTS

PART I
GENERAL INSUANCE COVERAGES (GIC)

GCI 1 Insured
(02/12/03)

Each insurance policy shall insure the Contractor, and shall include, as an Additional Named Insured, Her Majesty the Queen in right of Canada, represented by the National Research Council Canada.

GIC 2 Period of Insurance
(02/12/03)

Unless otherwise directed in writing by the Contracting Officer or otherwise stipulated elsewhere in these Insurance Conditions, the policies required hereunder shall be in force and be maintained from the date of the contract award until the day of issue of the Departmental Representative's Final Certificate of Completion.

GIC 3 Proof of Insurance
(01/10/94)

Within twenty five (25) days after acceptance of the Contractor's tender, the Insurer shall, unless otherwise directed by the Contractor, deposit with the Contractor an Insurer's Certificate of Insurance in the form displayed in the document and, if requested, the originals or certified true copies of all contracts of insurance maintained by the Contractor pursuant to the requirements of these Insurance Coverages.

GIC 4 Notification
(01/10/94)

Each Insurance policy shall contain a provision that (30) days prior written notice shall be given by the Insurer to Her Majesty in the event of any material change in or cancellation of coverage. Any such notice received by the Contractor shall be transmitted forthwith to Her Majesty.

PART II
COMMERCIAL GENERAL LIABILITY

CGL 1 Scope of Policy
(01/10/94)

The policy shall be written on a form similar to that known and referred to in the insurance industry as IBC 2100 – Commercial General Liability policy (Occurrence form) and shall provide for limit of liability of not less than $2,000,000 inclusive for Bodily Injury and Property Damage for any one occurrence or series of occurrences arising out of one cause. Legal or defence cost incurred in respect of a claim or claims shall not operate to decrease the limit of liability.

CGL 2 Coverages/Provisions
(01/10/94)

The policy shall include but not necessarily be limited to the following coverages/provisions.

2.1 Liability arising out of or resulting from the ownership, existence, maintenance or use of premises by the Contractor and operations necessary or incidental to the performance of this contract.

2.2 "Broad Form" Property Damage including the loss of use of property.

2.3 Removal or weakening of support of any building or land whether such support be natural or otherwise.

2.4 Elevator liability (including escalators, hoists and similar devices).

2.5 Contractor's Protective Liability

2.6 Contractual and Assumed Liabilities un this contact.

2.7 Completed Operations Liability – The insurance, including all aspects of this Part II of these Insurance Conditions shall continue for a period of at least one (1) year beyond the date of the Departmental Representative's Final Certificate of Completion for the Completed Operations.

2.8 Cross Liability – The Clause shall be written as follows:

Cross Liability – The insurance as is afforded by this policy shall apply in respect to any claim or action brought against any one Insured by any other Insured. The coverage shall apply in the same manner and to the same extent as though a separate policy had been issued to each Insured. The inclusion herein of more than one Insured shall not increase the limit of the Insurer's liability.

2.9 Severability of Interests – The Clause shall be written as follows:

Severability of Interests – This policy, subject to the limits of liability stated herein, shall apply separately to each Insured in the same manner and to the same extent as if a separate policy had been issued to each. The inclusion herein of more than one insured shall not increase the limit of the Insurer's liability.

CGL 3 Additional Exposures
(02/12/03)

The policy shall either include or be endorsed to include the following exposures of hazards if the Work is subject thereto:

3.1 Blasting

3.2 Pile driving and calsson work

3.3 Underpinning

3.4 Risks associated with the activities of the Contractor on an active airport

3.5 Radioactive contamination resulting from the use of commercial isotopes

3.6 Damage to the portion of an existing building beyond that directly associated with an addition, renovation or installation contract.

3.7 Marine risks associated with the contraction of piers, wharves and docks.

CGL 4 Insurance Proceeds
(01/10/94)

Insurance Proceeds from this policy are usually payable directly to a Claimant/Third Party.

CGL 5 Deductible
(02/12/03)

This policy shall be issued with a deductible amount of not more than $10,000 per occurrence applying to Property Damage claims only.

PART III
BUILDER'S RISK – INSTALLATION FLOATER – ALL RISKS

BR 1 Scope of Policy
(01/10/94)

The policy shall be written on an "All Risks" basis granting coverages similar to those provided by the forms known and referred to in the insurance industry as "Builder's Risk Comprehensive Form" or "Installation Floater – All Risks".

BR 2 Property Insured
(01/10/94)

The property insured shall include:

2.1 The Work and all property, equipment and materials intended to become part of the finished Work at the site of the project while awaiting, during and after installation, erection or construction including testing.

2.2 Expenses incurred in the removal from the construction site of debris of the property insured, including demolition of damaged property, de-icing and dewatering, occasioned by loss, destruction or damage to such property and in respect of which insurance is provided by this policy.

BR 3 Insurance Proceeds
(01/10/94)

3.1 Insurance proceeds from this policy are payable in accordance with GC28 of the General Conditions "C" of the contract.

3.2 This policy shall provide that the proceeds thereof are payable to Her Majesty or as the Minister may direct.

3.3 The Contractor shall do such things and execute such documents as are necessary to effect payment of the proceeds.

BR 4 Amount of Insurance
(01/10/94)

The amount of insurance shall not be 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 Her Majesty at the site of the project to be incorporated into and form part of the finished Work.

BR 5 Deductible
(02/12/03)

The Policy shall be issued with a deductible amount of not more than $10,000.

BR 6 Subrogation
(01/10/94)

The following Clause shall be included in the policy:

"All rights of subrogation or transfer of rights are hereby waived against any corporation, firm, individual or other interest, with respect to which, insurance is provided by this policy".

BR 7 Exclusion Qualifications
(01/10/94)

The policy may be subject to the standard exclusions but the following qualifications shall apply:

7.1 Faulty materials, workmanship or design may be excluded only to the extent of the cost of making good thereof and shall not apply to loss or damage resulting therefrom.

7.2 Loss or damage caused by contamination by radioactive material may be excluded except for loss or damage resulting from commercial isotopes used for industrial measurements, inspection, quality control radiographic or photographic use.

7.3 Use and occupancy of the project or any part of section thereof shall be permitted where such use and occupancy is for the purpose for which the project is intended upon completion.

INSURER'S CERTIFICATE OF INSURANCE

(TO BE COMPLETED BY INSURER (NOT BOKER) AND DELIVERD TO NATIONAL RESEARCH COUNCIL CANADA WITH 30 DAYS FOLLOWING ACCEPTANCE OF TENDER)

CONTRACT

DESCRIPTION OF WORK	CONTRACT NUMBER	AWARD DATE
LOCATION		

INSURER

NAME
ADDRESS

BROKER

NAME
ADDRESS

INSURED

NAME OF CONTRACTOR
ADDRESS

ADDITIONAL INSURED

HER MAJESTY THE QUEEN IN RIGHT OF CANADA AS REPRESENTED BY THE NATIONAL RESEARCH COUNCIL CANADA

THIS DOCUENT CERTIFIES THAT THE FOLLOWING POLICES OF INSURANCE ARE AT PRESENT IN FORCE COVERING ALL OPERATIONS OF THE INSURE IN CONNECTION WITH THE CONTRACT MADE BETWEEN THE NAMED INSURED AND THE NATIONAL RESEARCH COUNCIL CANADA AND IN ACCORDANCE WITH THE INSURANCE CONDITIONS "E"

POLICY					
TYPE	NUMBER	INCEPTION DATE	EXPIRY DATE	LIMITS OF LIABILITY	DEDUCTIBLE
COMMERCIAL GENERAL LIABILITY					
BUILDERS RISK "AL RISKS"					
INSTALLATION FLOATER "ALL RISKS"					

THE INSURER AGREES TO NOTIFY THE NATIONAL RESEARCH COUNCIL CANADA IN WRITING 30 DAYS PRIOR TO ANY MATERIAL CHANGE IN OR CANCELLATION OF ANY POLICY OR COVERAGE SPECIFICALLY RELATED TO THE CONTRACT

NAME OF INSURER'S OFFICER OR AUTHORIZED EMPLOYEE	SIGNATURE	DATE:
		TELEPHONE NUMBER:

ISSUANCE OF THIS CERTIFIATE SHALL NOT LIMIT OR RESTRICT THE RIGHT OF THE NATIONAL RESEARCH COUNCIL CANADA TO REQUEST AT ANY TIME DUPLICATE COPIES OF SAID INSURANCE POLICIES

CS1 Obligation to provide Contract Security

1.1 The Contractor shall, at the Contractor's own expense, provide one or more of the forms of contract security prescribed in CS2.

1.2 The Contractor shall deliver to the Departmental Representative the contract security referred to in CS1.1 within 14 days after the date that the Contractor receives notice that the Contractor's tender or offer was accepted by Her Majesty.

CS2 Prescribed Types and Amounts of Contract Security

2.1 The Contractor shall deliver to the Departmental Representative pursuant to CS1

2.1.1 a performance bond and a labour and material payment bond each in an amount that is equal to not less than 50% of the contract amount referred to in the Articles of Agreement, or

2.1.2 a labour and material payment bond in an amount that is equal to not less than 50% of the contract amount referred to in the Articles of Agreement, and a security deposit in an amount that is equal to

2.1.2.1 not less than 10% of the contract amount referred to in the Articles of Agreement where that amount does not exceed $250,000, or

2.1.2.2 $25,000 plus 5% of the part of the contract amount referred to in the Articles of Agreement that exceeds $250,000, or

2.1.3 a security deposit in an amount prescribed by CS2.12 plus an additional amount that is equal to 10% of the contract amount referred to in the Articles of Agreement.

2.2 A performance bond and a labour and material payment bond referred to in CS2.1 shall be in a form and be issued by a bonding or surety company that is approved by Her Majesty.

2.3 The amount of a security deposit referred to in CS2.1.2 shall not exceed $250,000 regardless of the contract amount referred to in the Articles of Agreement.

2.4 A security deposit referred to in CS2.1.2 and CS2.1.3 shall be in the form of

2.4.1 a bill of exchange made payable to the Receiver General of Canada and certified by an approved financial institution or drawn by an approved financial institution on itself, or

2.4.2 bonds of or unconditionally guaranteed as to principal and interest by the Government of Canada.

2.5 For the purposes of CS2.4

2.5.1 a bill of exchange is an unconditional order in writing signed by the Contractor and addressed to an approved financial institution, requiring the said institution to pay, on demand, at a fixed or determinable future time a sum certain of money to, or to the order

of, the Receiver General for Canada, and

2.5.2 If a bill of exchange is certified by a financial institution other than a chartered bank then it must be accompanied by a letter or stamped certification confirming that the financial institution is in a t least one of the categories referred to in CS2.5.3

2.5.3 an approved financial institution is

2.5.3.1 any corporation or institution that is a member of the Canadian Payments Association,

2.5.3.2 a corporation that accepts deposits that are insured by the Canada Deposit Insurance Corporation or the Régie de l'assurance-dépôts du Québec to the maximum permitted by law,

2.5.3.3 a credit union as defined in paragraph 137(6)(b) of the *Income Tax Act*,

2.5.3.4 a corporation that accepts deposits from the public, if repayment of the deposit is guaranteed by Her Majesty in right of a province, or

2.5.3.5 The Canada Post Corporation.

2.5.4 the bonds referred to in CS2.4.2 shall be

2.5.4.1 made payable to bearer, or

2.5.4.2 accompanied by a duly executed instrument of transfer of the bonds to the Receiver General for Canada in the form prescribed by the Domestic Bonds of Canada Regulations, or

2.5.4.3 registered, as to principal or as to principal and interest in the name of the Receiver General for Canada pursuant to the Domestic Bonds of Canada Regulations, and

2.5.4.4 provided on the basis of their market value current at the date of the contract.

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat	
Security Classification / Classification de sécurité	

SECURITY REQUIREMENTS CHECK LIST (SRCL)
LISTE DE VÉRIFICATION DES EXIGENCES RELATIVES À LA SÉCURITÉ (LVERS)

PART A - CONTRACT INFORMATION / PARTIE A - INFORMATION CONTRACTUELLE

1. Originating Government Department or Organization / Ministère ou organisme gouvernemental d'origine	2. Branch or Directorate / Direction générale ou Direction
National Research Council	ASPM/SAGI

3. a) Subcontract Number / Numéro du contrat de sous-traitance	3. b) Name and Address of Subcontractor / Nom et adresse du sous-traitant

4. Brief Description of Work / Brève description du travail

U-85- CNG Filling Station and Electrical Charging Stations for vehicles

5. a) Will the supplier require access to Controlled Goods? Le fournisseur aura-t-il accès à des marchandises contrôlées?	☒ No Non	☐ Yes Oui
5. b) Will the supplier require access to unclassified military technical data subject to the provisions of the Technical Data Control Regulations? Le fournisseur aura-t-il accès à des données techniques militaires non classifiées qui sont assujetties aux dispositions du Règlement sur le contrôle des données techniques?	☒ No Non	☐ Yes Oui
6. Indicate the type of access required / Indiquer le type d'accès requis		
6. a) Will the supplier and its employees require access to PROTECTED and/or CLASSIFIED information or assets? Le fournisseur ainsi que les employés auront-ils accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS? (Specify the level of access using the chart in Question 7. c) (Préciser le niveau d'accès en utilisant le tableau qui se trouve à la question 7. c)	☒ No Non	☐ Yes Oui
6. b) Will the supplier and its employees (e.g. cleaners, maintenance personnel) require access to restricted access areas? No access to PROTECTED and/or CLASSIFIED information or assets is permitted. Le fournisseur et ses employés (p. ex. nettoyeurs, personnel d'entretien) auront-ils accès à des zones d'accès restreintes? L'accès à des renseignements ou à des biens PROTÉGÉS et/ou CLASSIFIÉS n'est pas autorisé.	☐ No Non	☒ Yes Oui
6. c) Is this a commercial courier or delivery requirement with **no** overnight storage? S'agit-il d'un contrat de messagerie ou de livraison commerciale **sans** entreposage de nuit?	☒ No Non	☐ Yes Oui

7. a) Indicate the type of information that the supplier will be required to access / Indiquer le type d'information auquel le fournisseur devra avoir accès

Canada ☒	NATO / OTAN ☐	Foreign / Étranger ☐

7. b) Release restrictions / Restrictions relatives à la diffusion

Canada	NATO / OTAN	Foreign / Étranger
No release restrictions / Aucune restriction relative à la diffusion ☒	All NATO countries / Tous les pays de l'OTAN ☐	No release restrictions / Aucune restriction relative à la diffusion ☐
Not releasable / À ne pas diffuser ☐		
Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐	Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐	Restricted to: / Limité à : Specify country(ies): / Préciser le(s) pays : ☐

7. c) Level of information / Niveau d'information

Canada	NATO	Foreign / Étranger
PROTECTED A / PROTÉGÉ A ☐	NATO UNCLASSIFIED / NATO NON CLASSIFIÉ ☐	PROTECTED A / PROTÉGÉ A ☐
PROTECTED B / PROTÉGÉ B ☐	NATO RESTRICTED / NATO DIFFUSION RESTREINTE ☐	PROTECTED B / PROTÉGÉ B ☐
PROTECTED C / PROTÉGÉ C ☐	NATO CONFIDENTIAL / NATO CONFIDENTIEL ☐	PROTECTED C / PROTÉGÉ C ☐
CONFIDENTIAL / CONFIDENTIEL ☐	NATO SECRET / NATO SECRET ☐	CONFIDENTIAL / CONFIDENTIEL ☐
SECRET / SECRET ☐	COSMIC TOP SECRET / COSMIC TRÈS SECRET ☐	SECRET / SECRET ☐
TOP SECRET / TRÈS SECRET ☐		TOP SECRET / TRÈS SECRET ☐
TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐		TOP SECRET (SIGINT) / TRÈS SECRET (SIGINT) ☐

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat
Security Classification / Classification de sécurité

PART A *(continued)* / PARTIE A *(suite)*

8. Will the supplier require access to PROTECTED and/or CLASSIFIED COMSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens COMSEC désignés PROTÉGÉS et/ou CLASSIFIÉS?
If Yes, indicate the level of sensitivity:
Dans l'affirmative, indiquer le niveau de sensibilité :

9. Will the supplier require access to extremely sensitive INFOSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur aura-t-il accès à des renseignements ou à des biens INFOSEC de nature extrêmement délicate?

Short Title(s) of material / Titre(s) abrégé(s) du matériel :
Document Number / Numéro du document :

PART B - PERSONNEL (SUPPLIER) / PARTIE B - PERSONNEL (FOURNISSEUR)

10. a) Personnel security screening level required / Niveau de contrôle de la sécurité du personnel requis

☒ RELIABILITY STATUS / COTE DE FIABILITÉ	☐ CONFIDENTIAL / CONFIDENTIEL	☐ SECRET / SECRET	☐ TOP SECRET / TRÈS SECRET
☐ TOP SECRET– SIGINT / TRÈS SECRET – SIGINT	☐ NATO CONFIDENTIAL / NATO CONFIDENTIEL	☐ NATO SECRET / NATO SECRET	☐ COSMIC TOP SECRET / COSMIC TRÈS SECRET
☐ SITE ACCESS / ACCÈS AUX EMPLACEMENTS			

Special comments:
Commentaires spéciaux : _____

NOTE: If multiple levels of screening are identified, a Security Classification Guide must be provided.
REMARQUE : Si plusieurs niveaux de contrôle de sécurité sont requis, un guide de classification de la sécurité doit être fourni.

10. b) May unscreened personnel be used for portions of the work? — ☒ No / Non ☐ Yes / Oui
Du personnel sans autorisation sécuritaire peut-il se voir confier des parties du travail?
If Yes, will unscreened personnel be escorted? — ☒ No / Non ☐ Yes / Oui
Dans l'affirmative, le personnel en question sera-t-il escorté?

PART C - SAFEGUARDS (SUPPLIER) / PARTIE C - MESURES DE PROTECTION (FOURNISSEUR)

INFORMATION / ASSETS / RENSEIGNEMENTS / BIENS

11. a) Will the supplier be required to receive and store PROTECTED and/or CLASSIFIED information or assets on its site or premises? — ☒ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu de recevoir et d'entreposer sur place des renseignements ou des biens PROTÉGÉS et/ou CLASSIFIÉS?

11. b) Will the supplier be required to safeguard COMSEC information or assets? — ☒ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu de protéger des renseignements ou des biens COMSEC?

PRODUCTION

11. c) Will the production (manufacture, and/or repair and/or modification) of PROTECTED and/or CLASSIFIED material or equipment occur at the supplier's site or premises? — ☒ No / Non ☐ Yes / Oui
Les installations du fournisseur serviront-elles à la production (fabrication et/ou réparation et/ou modification) de matériel PROTÉGÉ et/ou CLASSIFIÉ?

INFORMATION TECHNOLOGY (IT) MEDIA / SUPPORT RELATIF À LA TECHNOLOGIE DE L'INFORMATION (TI)

11. d) Will the supplier be required to use its IT systems to electronically process, produce or store PROTECTED and/or CLASSIFIED information or data? — ☒ No / Non ☐ Yes / Oui
Le fournisseur sera-t-il tenu d'utiliser ses propres systèmes informatiques pour traiter, produire ou stocker électroniquement des renseignements ou des données PROTÉGÉS et/ou CLASSIFIÉS?

11. e) Will there be an electronic link between the supplier's IT systems and the government department or agency? — ☒ No / Non ☐ Yes / Oui
Disposera-t-on d'un lien électronique entre le système informatique du fournisseur et celui du ministère ou de l'agence gouvernementale?

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat
Security Classification / Classification de sécurité

PART C - *(continued)* / PARTIE C - *(suite)*

For users completing the form **manually** use the summary chart below to indicate the category(ies) and level(s) of safeguarding required at the supplier's site(s) or premises.
Les utilisateurs qui remplissent le formulaire **manuellement** doivent utiliser le tableau récapitulatif ci-dessous pour indiquer, pour chaque catégorie, les niveaux de sauvegarde requis aux installations du fournisseur.

For users completing the form **online** (via the Internet), the summary chart is automatically populated by your responses to previous questions.
Dans le cas des utilisateurs qui remplissent le formulaire **en ligne** (par Internet), les réponses aux questions précédentes sont automatiquement saisies dans le tableau récapitulatif.

SUMMARY CHART / TABLEAU RÉCAPITULATIF

Category / Catégorie	PROTECTED / PROTÉGÉ			CLASSIFIED / CLASSIFIÉ			NATO				COMSEC					
	A	B	C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRÈS SECRET	NATO RESTRICTED / NATO DIFFUSION RESTREINTE	NATO CONFIDENTIAL / NATO CONFIDENTIEL	NATO SECRET	COSMIC TOP SECRET / COSMIC TRÈS SECRET	PROTECTED / PROTÉGÉ A	PROTECTED / PROTÉGÉ B	PROTECTED / PROTÉGÉ C	CONFIDENTIAL / CONFIDENTIEL	SECRET	TOP SECRET / TRES SECRET
Information / Assets / Renseignements / Biens																
Production	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
IT Media / Support TI	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
IT Link / Lien électronique	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

12. a) Is the description of the work contained within this SRCL PROTECTED and/or CLASSIFIED?
La description du travail visé par la présente LVERS est-elle de nature PROTÉGÉE et/ou CLASSIFIÉE?

☒ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification".
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire.

12. b) Will the documentation attached to this SRCL be PROTECTED and/or CLASSIFIED?
La documentation associée à la présente LVERS sera-t-elle PROTÉGÉE et/ou CLASSIFIÉE?

☒ No / Non ☐ Yes / Oui

If Yes, classify this form by annotating the top and bottom in the area entitled "Security Classification" and indicate with attachments (e.g. SECRET with Attachments).
Dans l'affirmative, classifier le présent formulaire en indiquant le niveau de sécurité dans la case intitulée « Classification de sécurité » au haut et au bas du formulaire et indiquer qu'il y a des pièces jointes (p. ex. SECRET avec des pièces jointes).

Government of Canada / Gouvernement du Canada

Contract Number / Numéro du contrat	
Security Classification / Classification de sécurité	

PART D - AUTHORIZATION / PARTIE D - AUTORISATION

13. Organization Project Authority / Chargé de projet de l'organisme

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature	
Bruno Vallieres	Manager Facilities Engineering Unit		
Telephone No. - N° de téléphone	**Facsimile No. - N° de télécopieur**	**E-mail address - Adresse courriel**	**Date**
613-991-5586	613-957-9828	Bruno.Vallieres@nrc-cnrc.gc.ca	April 14th/2014

14. Organization Security Authority / Responsable de la sécurité de l'organisme

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature	
Charlotte Carrier	***Controlled Goods and Contracts Security Coordinator***		
Telephone No. - N° de téléphone	**Facsimile No. - N° de télécopieur**	**E-mail address - Adresse courriel**	**Date**
(613) 993-8956	(613) 990-0946	Charlotte.Carrier@nrc-cnrc.gc.ca	14 Apr 2014

15. Are there additional instructions (e.g. Security Guide, Security Classification Guide) attached?
Des instructions supplémentaires (p. ex. Guide de sécurité, Guide de classification de la sécurité) sont-elles jointes?
☒ No / Non ☐ Yes / Oui

16. Procurement Officer / Agent d'approvisionnement

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature	
MARC BEDARD	Senior Contracting Officer		
Telephone No. - N° de téléphone	**Facsimile No. - N° de télécopieur**	**E-mail address - Adresse courriel**	**Date**
613 993-2274			22/4/14

17. Contracting Security Authority / Autorité contractante en matière de sécurité

Name (print) - Nom (en lettres moulées)	Title – Titre	Signature	
Telephone No. - N° de téléphone	**Facsimile No. - N° de télécopieur**	**E-mail address - Adresse courriel**	**Date**