MUNICIPALITY OF WEST NIPISSING
WATER TREATMENT PLANT – GENSET UPGRADE
WEST NIPISSING, ON
PROJECT NO. 6701
JANUARY 2025

2025-012

Piotrowski Consultants Ltd.
1820 Bond Street
North Bay, ON P1B 4V6

I N D E X

PART 1 - GENERAL

1.1 LOCATION

.1 Municipality of West Nipissing – Water Treatment Plant is located at 11 Nipissing Street, Sturgeon Falls, ON.

1.2 RESERVED RIGHTS

.1 The Owner reserves the right to reject any or all tenders in their best interest. The lowest or any tender shall not necessarily be accepted.

.2 Tenders which are incomplete, conditional, illegible, or obscure, or that contain additions not called for, reservations, erasures, alterations or irregularities of any kind may be rejected as informal.

.3 Tenders that contain prices which appear to be so unbalanced as likely to affect adversely the interests of the Owner may be rejected.

.4 Wherever in a tender the amount tendered for an item does not agree with the extension of the estimated quantity and the tendered unit price, the unit price shall govern and the amount of the Total Tender Price shall be corrected accordingly.

.5 The award of any contract shall be conditional upon funding availability as dictated by the budget of Municipality of West Nipissing.

.6 This tender shall remain open for acceptance for a period of 60 days.

1.3 DELIVERY AND OPENING OF TENDERS

.1 Tenders sealed in the envelope provided; marked “Municipality of West Nipissing – Water Treatment Plant, Genset Upgrades - Piotrowski Consultants 1820 Bond Street, North Bay ON” will be received by **February 27, 2025 until 2:00 p.m**. and no later than 2:00 p.m. local time date.

.2 Under no circumstances will tenders be considered which: a) are received after 2:00 p.m., the advertised closing date for tenders, i.e. 2:01 p.m.; b) are not accompanied by a tender deposit as specified; c) are not received in the official tender envelope.

1.4 WITHDRAWAL OR QUALIFYING OF TENDERS

.1 A tenderer who has already submitted a tender may submit a further tender at any time up to the Official closing time. The last tender received shall supersede and invalidate a tender previously submitted by that tenderer for this Contract.

.2 A tenderer may withdraw or qualify his tender at any time up to the Official closing time by submitting a letter bearing his signature and seal as in his tender to the Owner who will mark there on the time and date of receipt and will place the letter in the tender box. No facsimile,

telegraph or telephone calls will be considered.

1.5 COMPLETION DATE

.1 The following to be completed from date of award to **December 12th 2025.**

1.6 BID BONDS

1. The Contractor shall furnish with their tender, a Bid Bond in the amount of ten percent (10%) of the contract amount. Certified cheques will be accepted.

2. All Bid Bonds shall be from a recognized surety company payable to the Owner and guaranteeing that if awarded the contract:

    1. The bidders shall enter into and execute a formal contract within the time limit specified,

    2. and shall furnish the security required for the performance of the contract.

1.7 BONDING

.1 Performance Bond and Labour and Material Payment Bond to be provided – 50% (Specification Section 00800 – 49 Contract Security).

1.8 INFLUENCE

.1 No person, company, corporation or organization shall attempt in any way, either in private or in public, to influence the outcome of any Municipality of West Nipissing purchasing or disposal process. The bid, quotation or proposal of any person, company, corporation or organization that does attempt to influence the outcome of any Municipality of West Nipissing purchasing or disposal process will be disqualified, and the person, company, corporation or organization may be subjected to exclusion or suspension under the Vendor Performance Policy.

1.9 HEALTH & SAFETY

.1 The contractor shall perform all work in compliance with the Occupational Health and Safety Act of Ontario.

.2 The Contractor acknowledges its duty as an employer and a supervisor under the Occupational Health and Safety Act and under the applicable regulations and in particular, that the Contractor shall take every precaution reasonable under the circumstances for the protection of a worker.

.3 The Contractor acknowledges possession of a copy of the Occupational Health and Safety Act and applicable regulations for this contract.

.4 The Contractor shall provide all required safety and personal protective equipment as

required under the Occupational Health and Safety Act or the Safety Policies of the Contractor. Municipality of West Nipissing has the right to stop the work if improper performance of any kind is being carried out.

.5 The Contractor releases and discharges Municipality of West Nipissing and Piotrowski Consultants Ltd. from any claim or demand for any action taken by Municipality of West Nipissing to exercise its duties of due diligence under the Occupational Health and Safety Act.

1.10 INDEMNITY

.1 The Contractor agrees to indemnify and save harmless Municipality of West Nipissing and Piotrowski Consultants Ltd. from any claim or demand arising as a result of the performance or non-performance of this Contract by the Contractor, and without limiting the generality of the foregoing, the Contractor agrees to indemnify and save harmless Municipality of West Nipissing and Piotrowski Consultants Ltd. from any claim or demand arising after the expiry of any reasonable time limit fixed by Municipality of West Nipissing for the completion of any work as assigned from time to time.

1.11 ENVIRONMENTAL CONTROL

.1 The contractor is responsible for the site environmental and shall be responsible for any and all damages, spills, site clean-up and restoration, according to applicable codes, standards, practices, and legislation for any issues caused as a result of the contractor's work and equipment on site.

1.12 APPLICABLE LEGISLATION

.1 All work shall meet any and all applicable codes, legislation (Acts and Regulations), practices, and standards in relation to the works.

.2 The Contractor shall be responsible for all cable locates and required permits required for commencement and completion of the work specified.

1.13 ABILITY AND EXPERIENCE OF TENDERER

.1 It is not the intention of Municipality of West Nipissing to award this Contract to any Tenderer who does not furnish satisfactory evidence that he has sufficient capital and plant to enable him to execute and complete the same successfully, and to complete it within the time stated in the Contract.

1.14 BIDDER'S CONFERENCE

.1 A **mandatory bidder's** conference will take place on site **February 12, 2025 at 10:00am**. Failure to attend will render your bid non-responsive.

1.15 DISCREPANCIES AND/OR OMISSIONS

.1 Should a tenderer find discrepancies in, or omissions from the drawings, specifications or

other tender documents, or should he be in doubt as to their meaning, he should notify the Purchasing Manager, preferably in writing and not later than eight days before the closing date for tenders. If the Purchasing Manager considers that a correction, explanation or interpretation is necessary or desirable, he will issue an addendum to all who have taken out tender documents.

1.16 INTERPRETATIONS AND ADDENDA

.1 No oral interpretations shall be made to a tenderer as to the meaning of any of the tender documents, or be effective to modify any other provisions of the tender documents. Every request for an interpretation shall be made in writing, addressed and forwarded to the Site Authority.

.2 Tenderers may be advised during the tendering period, by Addenda, of required additions to, deletions from, or alterations in the requirements of the tender documents. All such changes shall become an integral part of the tender documents and shall be allowed for in arriving at the fixed tender sum.

.3 Tenderers shall insert, in the space provided on the Tender form, the addenda numbers of all Addenda received by them during the tendering period, including any bound into the contract documents. If no Addenda have been received, the work, "NONE" shall be inserted in the space provided on the Tender Form.

1.17 INQUIRIES

.1 All inquiries regarding tender documents should be directed to the following contact persons:

Ryan MacVicar, P. Eng.
Piotrowski Consultants Ltd.
Telephone (705) 472-2536 Fax (705) 476-5105
Email: pcl@piotrowskiconsultants.ca

1.18 EQUALS

.1 It is intended that all materials specified in the specifications shall be used with no equals. Should a contractor desire to use "equals," such must be approved by the Consultant in writing, seven (7) full working days prior to the closing date of tenders. No "equals" shall be allowed after closing date of tenders.

1.19 WARRANTY

.1 Full warranty shall be provided for a period of one (1) year.

.2 It shall be specifically understood that the one year (1 year) period of warranty from the date of Substantial Performance, refers to the date of Substantial Performance of the entire contract and does not refer to dates of Substantial or Total Performance by subcontractors and/or Delivery of Products by Suppliers.

.3 The entire project, all work and products, shall be under warranty or as specified for a period of one (1) year from the date of Substantial Performance of the entire contract. This condition also applies to subcontractors and suppliers who may have completed their work prior to the substantial performance date referred to above.

.4 In the case of warranty work required, that portion of the work or products under repair, shall be warranted for a further period of one year (1 year) from the date of repair work or replacement performed.

.5 Provide longer that one year (1 year) warranties or guarantees where required by the Contract Documents.

1.20 INSURANCE

.1 The Contractor agrees to Indemnify and save harmless Municipality of West Nipissing and Piotrowski Consultants Ltd. for any claim demand arising out of the performance by the Contractor of the Contract. The Contractor agrees to maintain comprehensive liability insurance covering all operations and liability assumed under the Contract. Have a limit of liability of not less than $2,000,000.00 inclusive for any one occurrence

1.21 WORKPLACE SAFETY AND INSURANCE BOARD

.1 The tenderer whose tender has been recommended to the Owner for acceptance shall submit such Statutory Declaration, or a satisfactory clearance letter from the Work Place Safety and Insurance Board, to the Owner. One (1) copy of the Statutory Declaration or clearance letter shall be bound into each of the four (4) executed sets of the Contract.

1.22 SALES TAX

.1 All sales taxes shall be included. The Contractors will be requested to submit the copies of material invoices to Owners.

1.23 LIST OF CONTRACT DOCUMENTS

.1 The contract documents Canadian Standard Construction Documents C.C.D.C #2 2020 Stipulated Price Contract.

.2 Specifications for Municipality of West Nipissing Water Treatment Plant, Genset Upgrades

.3 Drawings:

Mechanical – ME101 – ME103

Electrical – E101 – E102

Structural – S100

END OF SECTION 00100

1.1. GENERAL

1. The successful tenders, when awarded the Contract, shall be required to sign the Canadian Standard Construction Document C.C.D.C. #2 2020 Edition of the Stipulated Price Contract and the General Conditions of the Stipulated Price Contract, G.C. #1 to G.C. #14 inclusive and CCDC 41 as amended by the contract.

2. The foregoing document shall be considered as though bound herein and as an integral part of these specifications.

3. Where the term "Contract" is referred to in these specifications, it shall be understood to be this agreement for as described herein.

4. Where the term "Contract Documents" is referred to in these specifications, it shall be understood to be all of the documents including all drawings in the list of contract documents.

5. Failure of any bidder to inspect the contract documents shall signify he has read and acquainted himself fully with the terms of the documents from his own sources.

6. It is solely the responsibility of the tenderers to inspect and acquaint themselves with the conditions of the contract documents.

MUNICIPLAITY OF WEST NIPISSING
WATER TREATMENT PLANT
GENSET UPGRADES
WEST NIPISSING, ON
PROJECT NO. 6701
TENDER FORM

Date: _____

We: _____

(Name of Contractual Firm)

Hereby submit our proposal for work described by the Following Contract Documents:

Municipality of West Nipissing - Water Treatment Plant
Genset Upgrades
West Nipissing, ON
Project No. 6701
Dated: January 2025

We have examined these documents, and also Addendum(s) _____ of _____ (if applicable) and are familiar with all conditions affecting work.

The Undersigned proposes to furnish Labour, Materials, Equipment and Appliances required by the said documents for the project, for the Stipulated Sum of (excluding HST):

Base Bid Tender Price:

_____
(written in words)

_____ ($_____)
(written in numerals)

HST in the amount of _____
(written in words)

_____ ($_____)
(written in numerals)

Cash Allowance to be included in the Base Bid Tender Price:

1. **Cash Allowance in the amount of $25,000.00 plus HST for miscellaneous work.**

2. **Cash Allowance in the amount of $150,000.00 plus HST for costs associated with new gas service by Enbridge Gas.**

Subcontractors

The following sub-contractors will be engaged by the undersigned to complete the work described in the Contract Documents. See Section 00100 Instructions to Bidders, Item 1.9 Subcontractor Identification for details regarding this list, its use and implications.

General _____ Tel: _____

Mechanical _____ Tel: _____

Electrical _____ Tel: _____

Complete Tender Form, signed under seal, executed and dated submitted in sealed envelope, clearly marked **MUNICIPALITY OF WEST NIPISSING – WATER TREATMENT PLANT – GENSET UPGRADES,** will be received until **February 27, 2025 at 2:00:00 p.m. local time.**

Tender Forms submitted after 2:00:00 p.m. on the date noted above, will be returned to the Bidder unopened.

This Tender shall be valid for 60 days from the Tender Closing Date.

The Owner reserves the right to reject any or all Tenders or to accept any that are beneficial to Municipality of West Nipissing.

We are in a position to commence work immediately, and guarantee to meet deadlines indicated herein.

Construction Schedule for Project is from date of award to December 12, 2025.

The Undersigned to provide a Certificate of Good Standing from the WSIB , Proof of Insurance, Bid Bond and Agreement to Bond to be submitted with Tender Bid Form.

COMPANY NAME_____

SIGNATURE OF AUTHORIZED PRINCIPAL _____

TYPED NAME OF AUTHORIZED PRINCIPAL_____

DATE _____

ADDRESS _____

_____

TELEPHONE _____

SEAL

_____
(Witness – in case of no seal)

These Supplementary Conditions are made as of the _____ day of _____, 2025 between **[OWNER]** (the *"Owner"*) and **[CONTRACTOR]** (the *"Contractor*") . Other than the Supplementary Conditions contained herein, the Stipulated Price Contract (CCDC 2-2020) between the Owner and the Contractor remains in full force and effect (the "Contract"). The *Owner* and the *Contractor* hereby agree to supplement and amend the Definitions and General Conditions of the Contract as set out herein. Notwithstanding General Condition 1.1.7, where there is anything in the Contract which is inconsistent with these Supplementary Conditions, the provisions of these Supplementary Conditions shall govern. Throughout the Contract Documents, reference to the General Conditions or a paragraph of the General von Conditions shall include these Supplementary Conditions unless the context requires otherwise.

SC# GC# Supplementary Conditions

AGREEMENT BETWEEN OWNER AND CONTRACTOR

S Article A-3 Add the following to the list of Contract Documents in paragraph 3.1:

- Supplementary Conditions to the Stipulated Price Contract (CCDC 2 - 2020)

- *Drawings*

- *Specifications*

- Performance Bond

- Labour and Material Payment Bond

S Article A-5 Amend paragraph 5.1.3, in the first line, by deleting the words "..the issuance of the.." and replacing them with "…receipt of the Consultant's...."

S Article A-5 Add the following new paragraph 5.3 after paragraph 5.2:

The Owner is entitled to set off against any amounts otherwise due to Contractor pursuant to the terms of this Contract, any amounts which are due or owed to Owner from or by Contractor pursuant to the terms of the Contract, or being disputed in accordance with the terms of the Contract.

S Article A-9 Add new Article A-9 . Conflict of Interest:

1. The *Contractor*, all of the *Subcontractors* and S*uppliers* and any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall not engage in any activity or provide any services where such activity or the provision of such services creates a conflict of interest (actually or potentially, in the sole opinion of the *Owner*) with the provision of the *Work* pursuant to the Contract. The *Contractor* acknowledges and agrees that a conflict of interest, as described in this Article A-9, includes, but is not limited to, the use of *Confidential Information* where the *Owner* has not specifically authorized such use.

2. The *Contractor* shall disclose to the *Owner*, in writing, without delay, any actual or potential situation that may be reasonably interpreted as either a conflict of interest or a potential conflict of interest, including the retention of any *Subcontractor or Supplier* that is directly or indirectly affiliated with or related to the *Contractor*.

3. The *Contractor* covenants and agrees that it will not hire or retain the services of Any employee or previous employee of the *Owner* where to do so constitutes a breach by such employee or previous employee of the *Owner's* conflict of interest policy, as it may be amended from time to time, until after completion of the *Work* under the *Contract*.

4. It is of the essence of the *Contract* that the *Owner* shall not have direct or indirect liability to any *Subcontractor* or Supplier, and that the *Owner* relies on the maintenance of an arm's-length relationship between the *Contractor* and its

Subcontractors and Suppliers. Consistent with this fundamental term of the *Contract*, the *Contractor* will not enter into any agreement or understanding with any *Subcontractor* or Supplier, whether as part of any contract or any written or oral collateral agreement, pursuant to which the parties thereto agree to cooperate in the presentation of a claim for payment against the *Owner*, directly or through the *Contractor*, where such claim is, in whole or in part, in respect of a disputed claim by the *Subcontractor* or Supplier against the *Contractor*, where the payment to the *Subcontractor* or Supplier by the *Contractor* is agreed to be conditional or contingent on the ability to recover those amounts or a portion thereof from the *Owner*, failing which the *Contractor* shall be saved harmless from all or a portion of those claims. The *Contractor* acknowledges that any such agreement would undermine the required arm's-length relationship and constitute a conflict of interest. For greater certainty, the *Contractor* shall only be entitled to advance claims against the *Owner* for amounts pertaining to *Subcontractor* or Supplier claims where the *Contractor* has actually paid or unconditionally acknowledged liability for those claims or where those claims are the subject of litigation or binding arbitration between the *Subcontractor* or Supplier and the *Contractor* has been found liable for those claims.

5. Notwithstanding paragraph 7.1.2 of GC 7.1 – OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR.S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT, a breach of this Article by the *Contractor*, any of the *Subcontractors*, or any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall entitle the *Owner* to terminate the *Contract*, in addition to any other rights and remedies that the *Owner* has in the *Contract*, in law, or in equity.

S Article A-10 Add new Article A-10 . Confidentiality

The *Contractor* agrees to ensure that it shall, both during or following the term of the *Contract*, maintain the confidentiality and security of all *Confidential Information* and *Personal Information*, and that it shall not directly or indirectly disclose, destroy, exploit, or use any *Confidential Information* or *Personal Information*, except where required by *Applicable Law*, without first obtaining the written consent of the *Owner*. The *Contractor* may disclose any portion of the *Contract Documents* or any *other information* provided to the *Contractor* by the *Owner* to any *Subcontractor* or *Supplier* if the *Contractor* discloses only such information as is necessary to fulfill the purposes of the *Contract* and the *Contractor* has included a commensurate confidentiality provision in its contract with the *Subcontractor* or *Supplier*. The *Contractor* acknowledges that it will comply with all requirements of the *Personal Information Protection and Electronic Documents Act*. The *Contractor* acknowledges that the *Owner* is bound by the provisions of *FIPPA.* The *Contractor* further acknowledges that the *Owner* may be required to disclose any or all of the *Confidential Information* and *Personal Information* in the event that it is compelled to do so by law, through a request under *FIPPA*, or by the rules of any applicable regulatory authority.

DEFINITIONS

S Definitions Add the following new definitions:

Applicable Law
Applicable Law means all public laws, statutes, ordinances, codes, acts, orders, by-laws, rules, regulations, *Governmental Consents*, binding policies and guidelines, and requirements of all Governmental Authorities, which now or hereafter, may be applicable to and enforceable against the *Owner*, the *Contractor* or the *Work*, or any part thereof, including those relating to employment, zoning, building, life/safety, environment and health.

As-Built Drawings
As-Built Drawings means drawings prepared by the *Contractor* by marking on a copy of the *Drawings* the changes from the *Drawings* which occur during construction including, but are

not limited to the exact location of major building components that were shown generally on the *Drawings*.

Confidential Information
Confidential Information means all the information or material of the *Owner* that is of a proprietary or confidential nature, whether it is identified as proprietary or confidential or not, including but not limited to information and material of every kind and description (such as drawings and move-lists) which is communicated to or comes into the possession or control of the *Contractor* at any time, but *Confidential Information* shall not include information that:

1. is or becomes generally available to the public without fault or breach on the part of the *Contractor*, including without limitation breach of any duty of confidentiality owed by the *Contractor* to the *Owner* or to any third party, but only after that information becomes generally available to the public;

2. the Contractor can demonstrate to have been rightfully obtained by the Contractor from a third party who had the right to transfer or disclose it to the Contractor free of any obligation of confidence;

3. the Contractor can demonstrate to have been rightfully known to or in the possession of the Contractor at the time of disclosure, free of any obligation of confidence; or

4. is independently developed by the *Contractor* without use of any *Confidential Information*.

Construction Act
Construction Act means the *Construction Act*, RSO 1990, c C.30.

Construction Act Document
Construction Act Document means a *Notice of Non-Payment*, a notice of adjudication given pursuant to Section 13.7 of Part II.1 of the *Construction Act* or any documents or responses to adjudication to be given or provided pursuant to Part II.1 of the *Construction Act*.

Construction Schedule
Construction Schedule means the schedule for the performance of the *Work* provided by the *Contractor* pursuant to GC 3.4, including any amendments to the *Construction Schedule* made pursuant to the *Contract Documents*.

FIPPA
FIPPA means the *Freedom of Information and Protection of Privacy Act*, RSO 1990, c F.31.

Force Majeure
Force Majeure means any cause, beyond the *Contractor's* control, other than bankruptcy or insolvency, which prevents the performance by the *Contractor* of any of its obligations under the *Contract* and the event of *Force Majeure* was not caused by the *Contractor's* default or active commission or omission and could not be avoided or mitigated by the exercise of reasonable effort or foresight by the *Contractor*. *Force Majeure* includes *Labour Disputes*, fire, unusual delay by common carriers or unavoidable casualties, civil disturbance, acts, orders, legislation, regulations or directives of any government or other public authority, acts of a public enemy, war, riot, sabotage, blockage, embargo, lightning, earthquake, or acts of God.

Governmental Consent
Governmental Consent means any license, right, permit, franchise, privilege, registration, direction, decree, consent, order, permission, approval, or authority to be issued or provided by a Governmental Authority and for clarity includes an agreement between the *Owner* and any Governmental Authority.

Install
Install means install and connect. *Install* has this meaning whether or not the first letter is capitalized.

Labour Dispute
Labour Dispute means any lawful or unlawful labour problems, work stoppage, labour disruption, strike, job action, slow down, lock-outs, picketing, refusal to work or continue to work, refusal to supply materials, cessation or work or other labour controversy which does, or might, affect the *Work*.

Notice of Non-Payment
A *Notice of Non-Payment* is a notice delivered pursuant to Section 6.4(2) of the *Construction Act* in the manner and form prescribed in the *Construction Act*.

Owner's Representative
Owner's *Representative* means any firm or individual engaged by the *Owner* to monitor the Project on its behalf or to represent it in any other capacity during the construction of the Project. Unless the *Owner* notifies the *Contractor* of a change in the *Owner*'s Representative, the *Owner*'s *Representative* for the Project is: **[●]**.

Overhead
Overhead means all site and head office operations and facilities, all site and head office administration and supervision; all duties and taxes for permits and licenses required by the authorities having jurisdiction at the *Place of the Work*; all requirements of Division 1, including but not limited to submittals, warranty, quality control, insurance and bonding; calculations, testing and inspections; meals and accommodations; and, tools, expendables and clean-up costs.

Personal Information
Personal Information has the same definition as in subsection 2(1) of *FIPPA* and includes an Individual's name, address, age, date of birth, sex, and religion, whether recorded in printed form, on film, by electronic means, or otherwise and disclosed to the *Contractor*.

Proper Invoice
Proper Invoice means an invoice submitted by the *Contractor* that includes all information required by GC 5.2.1, which includes the information required for a .*Proper Invoice*. in Section 6.1 of the *Construction Act*, and which is submitted in accordance with GC 5.2.1.

Proper Invoice Checklist
Proper Invoice Checklist means the checklist of additional items required in a *Proper Invoice* set out in Exhibit .1..

Provide
Provide means to supply and install. Provide has this meaning whether or not the first letter is capitalized.

Request for Information/RFI
Request for Information or RFI means written documentation sent by the Contractor to the Owner or to the Owner's Representative or the Consultant requesting written clarification(s) and/or interpretation(s) of the Drawings and/or Specifications, Contract requirements and/or other pertinent information required to complete the Work of the Contract without applying for a change or changes to the Work.

S Definitions Amend the definition for "*Consultant"* by adding the following to the end of the definition:

For the purposes of the Contract, the terms "*Consultant", "Architect" and "Engineer"* shall be considered synonymous.

GENERAL CONDITIONS

1. GC 1.1 CONTRACT DOCUMENTS

S GC 1.1.5 Amend paragraph 1.1.5.1 by adding “Amendments to CCDC 2 - 2020” before .the Agreement between the *Owner* and the *Contractor*. and deleting the reference to “Supplementary Conditions”..

S GC 1.1.5 Add new paragraphs 1.1.5.6, 1.1.5.7, 1.1.5.8, 1.1.5.9, and 1.1.5.10 as follows:

.6 finishes in the room finish schedules shall govern over those shown on the *Drawings*.

.7 Schedules of Division 1 . General Requirements of the *Specifications* shall form part of and be read in conjunction with the technical specification section as listed in the table of contents of the *Specifications*.

.8 architectural drawings shall have precedence over structural, plumbing, mechanical, electrical and landscape drawings insofar as outlining, determining and interpreting conflicts over the required design intent of all architectural layouts and architectural elements of construction, it being understood that the integrity and installation of the systems designed by the *Consultant* or its sub-consultants are to remain with each of the applicable drawing disciplines.

.9 fixturing drawings provided by the *Owner* shall have precedence over architectural drawings insofar as outlining, determining and interpreting conflicts over the required design intent of all architectural layouts.

.10 should reference standards contained in the *Specifications* conflict with the *Specifications*, the *Specifications* shall govern. Should reference standards and *Specifications* conflict with each other or if certain requirements of the *Specifications* conflict with other requirements of the *Specifications*, the more stringent requirements shall govern.

S GC 1.1.9 Add the following to the end of paragraph 1.1.9:

The *Specifications* are divided into divisions and sections for convenience but shall be read as a whole and neither such division nor anything else contained in the *Contract Documents* will be construed to place responsibility on the *Owner* or the *Consultant* to settle disputes among the *Subcontractors* and Suppliers with respect to such divisions. The *Drawings* are, in part, diagrammatic and are intended to convey the scope of the *Work* and indicate general and appropriate locations, arrangements and sizes of fixtures, equipment and outlets. The *Contractor* shall obtain more accurate information about the locations, arrangements and sizes from study and coordination of the *Drawings*, including *Shop Drawings* and shall become familiar with conditions and spaces affecting those matters before proceedings with the *Work*. Where site conditions require reasonable minor changes in indicated locations and arrangements, the *Contractor* shall make such changes at no additional cost to the *Owner*. Similarly, where known conditions or existing conditions interfere with new installation and require relocation, the *Contractor* shall include such relocation in the *Work*. The schedules are those portions of the Contact Documents, wherever located and whenever issued, which compile information of similar content and may consist of drawings, tables and/or lists.

S GC 1.1.12 Add new paragraph 1.1.12 as follows:

The *Contract Documents* shall be signed in duplicate (2) by the *Owner* and the *Contractor*, And each of the *Owner* and the *Contractor* shall retain one set of signed and sealed (if required by the governing law of the *Contract*) *Contract Documents*.

S GC 1.1.13 Add new paragraph 1.1.13 as follows:

The *Owner* shall provide the *Contractor*, without charge, a digital copy of the *Contract Documents*, in Adobe PDF format, to perform the *Work*. The *Contractor* shall obtain and pay for all hard/ paper copies of *Contract Documents* required for their own use, for building permit application and for 3 (three) *Contract* sets.”

2. GC 1.3 RIGHTS AND REMEDIES

S GC 1.3.2 Delete the word “No” from the beginning of paragraph 1.3.2 and substitute the words:

"Except with respect to the requirements set out in paragraphs 2.2.12, 6.4.1, 6.5.4, and 8.3.2, no.."

3. GC 1.4 ASSIGNMENT

S GC 1.4.1 Delete paragraph 1.4.1 in its entirety and replace with the following:

The *Contractor* shall not assign the *Contract*, or any portion thereof, without the prior written consent of the *Owner*, which consent may be unreasonably withheld. The *Owner* shall be entitled to assign the *Contract* to a corporation, partnership or other entity (the "Assignee"). Upon the assumption by the Assignee of the *Owner's* obligations under the *Contract*, the *Owner* shall be released from its obligations under the *Contract*.

4. GC 1.5 EXAMINATION OF DOCUMENTS AND SITE

S Add new General Condition 1.5 - EXAMINATION OF DOCUMENTS AND SITE as follows:

GC 1.5.1 The *Contractor* declares and represents that in tendering for the *Work*, and in entering into a *Contract* with the *Owner* for the performance of the *Work*, it has either investigated for itself the character of the *Work* to be done and all local conditions, including the location of any utility which can be determined from the records or other information available at the offices of any person, partnership, corporation, including a municipal corporation and any board or commission thereof having jurisdiction or control over the utility that might affect its tender or its acceptance of the *Work*, or that, not having so investigated, the *Contractor* has assumed and does hereby assume all risk of conditions now existing or arising in the course of the *Work* which might or could make the *Work*, or any items thereof more expensive in character, or more onerous to fulfil, than was contemplated or known when the tender was made or the *Contract* signed.

GC 1.5.2 The *Contractor* also declares that in tendering for the *Work* and in entering into this *Contract*, the *Contractor* did not and does not rely upon information furnished by the *Owner* or any of its agents or servants respecting the nature or confirmation of the ground at the site of the *Work*, or the location, character, quality or quantity of the materials to be removed or to be employed in the construction of *Work*, or the character of the construction machinery and equipment or facilities needed to perform the *Work*, or the general and local performance of the work under the *Contract* and expressly waives and releases the *Owner* from all claims with respect to the said information with respect to the *Work*.

5. GC 1.6 TIME IS OF THE ESSENCE OF THE CONTRACT

S Add new General Condition 1.6 - TIME IS OF THE ESSENCE OF THE CONTRACT as follows:

GC 1.6.1 All time limits stated in the Contract Documents are of the essence of the Contract.

6. GC 2.2 ROLE OF THE CONSULTANT

S GC 2.2.4 Add the following at the end of paragraph 2.2.4:

In the event that the certificate for payment is for an amount less than the full amount stated on the application for payment, the *Consultant* will issue a *Notice of Non-Payment* in respect of the disputed amount.

S GC 2.2.6 Delete the words "Except with respect to GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER".

S GC 2.2.12 Amend paragraph 2.2.12 by the addition of the following to the end of that paragraph:

If, in the opinion of the *Contractor*, the *Supplemental Instruction* involves an adjustment in the *Contract Price* or in the *Contract Time*, it shall, within ten (10) *Working Days* of receipt of

a *Supplemental Instruction*, provide the *Consultant* with a *Notice in Writing* to that effect. Failure to provide written notification within the time stipulated in this paragraph 2.2.12 shall be deemed an acceptance of the *Supplemental Instruction* by the *Contractor*, without any adjustment in the *Contract Price* or *Contract Time*.

S GC 2.2.19 Add new paragraph 2.2.19 as follows:

The *Consultant* or the *Owner*, acting reasonably, may from time to time require the *Contractor* to remove from the *Project* any personnel of the *Contractor*, including project managers, superintendents or *Subcontractors*. Such persons shall be replaced by the *Contractor* in a timely fashion to the satisfaction of the *Consultant* or the *Owner*, as the case may be, at no cost to the *Owner*.

7. GC 2.3 REVIEW AND INSPECTION OF THE WORK

S GC 2.3.2 Amend paragraph 2.3.2 by adding the words “and Owner” after the words “Consultant” in the second and third lines.

S GC 2.3.3 Delete paragraph 2.3.3 in its entirety and replace it with the following:

The *Contractor* shall furnish promptly two copies to the *Consultant* and one copy to the *Owner* of all certificates and inspection reports relating to the *Work*.

S GC 2.3.4 Insert the word .review. after the word “inspections” in the first line of paragraph 2.3.4.

S GC 2.3.5 In the first line after “Consultant”, add “or the Owner”..

S GC 2.3.8 Add new paragraph 2.3.8 as follows:

The *Consultant* will conduct periodic reviews of the *Work* in progress, to determine general conformance with the requirements of the *Contract Documents*. Such reviews, or lack thereof, shall not give rise to any claims by the *Contractor* in connection with construction means, methods, techniques, sequences and procedures, nor in connection with construction safety at the *Place of Work*, responsibility for which belongs exclusively to the *Contractor*.

8. GC 2.4 DEFECTIVE WORK

S GC 2.4.1 Amend GC 2.4.1 by inserting ., the Owner and/or its agent. in the first sentence following “rejected by the *Consultant*”..

S Add new paragraphs 2.4.1.1 and 2.4.1.2:

GC 2.4.1.1 The *Contractor* shall rectify, in a manner acceptable to the *Owner* and the *Consultant*, all defective work and deficiencies throughout the *Work*, whether or not they are specifically identified by the *Consultant*.

GC 2.4.1.2 The *Contractor* shall prioritize the correction of any defective work, which, in the sole discretion of the *Owner*, adversely affects the day to day operations of the *Owner* or which, in the sole discretion of the *Consultant*, adversely affects the progress of the *Work*.

S GC 2.4.2 Delete paragraph 2.4.2 in its entirety and replace it with the following:

The *Contractor* shall promptly pay the *Owner* for costs incurred by the *Owner*, the *Owner’s* own forces or the *Other Contractor’s*, for work destroyed or damaged or any alterations necessitated by the *Contractor’s* removal, replacement or re-execution of defective work. The *Owner* may request that the *Contractor* rectify any such deficiencies to *Other Contractor’s* work, at the *Contractor’s* expense.

S GC 2.4.4 Add new paragraph 2.4.4 as follows:

Neither acceptance of the *Work* by the *Consultant* or the *Owner*, nor any failure by the *Consultant* or the *Owner* to identify, observe or warn of defective *Work* or any deficiency in the *Work* shall relieve the *Contractor* from the sole responsibility for rectifying such defect or deficiency at the *Contractor's* sole cost, even where such failure to identify, observe or warn is negligent.

9. GC 3.1 CONTROL OF THE WORK

S GC 3.1.3 Add new paragraph 3.1.3 as follows:

Prior to commencing individual procurement, fabrication and construction activities, the *Contractor* shall verify at the *Place of the Work*, all relevant measurements and levels necessary for proper and complete fabrication, assembly and installation of the *Work* and shall further carefully compare such field measurements and conditions with the requirements of the *Contract Documents*. Where dimensions are not included or exact locations are not apparent, the *Contractor* shall immediately notify the *Consultant* in writing and obtain written instructions from the *Consultant* before proceedings with any part of the affected *Work*.

S GC 3.1.4 Add new paragraph 3.1.4 as follows:

Notwithstanding the provisions of paragraphs 3.1.1 and 3.1.2, the *Owner* shall have access to the site at all times to monitor all aspects of construction. Such access shall in no circumstances affect the obligations of the *Contractor* to fulfill its contractual obligations.

10. GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

S 3.2.2.1 Delete paragraph 3.2.2.1 in its entirety.

S 3.2.2.2 Delete paragraph 3.2.2.2 in its entirety.

S 3.2.2.3 Delete paragraph 3.2.2.3 in its entirety.

S 3.2.2.4 Delete paragraph 3.2.3.2 and replace it with the following:

Co-ordinate and schedule the activities and work of *Other Contractors* and *Owner's* own forces with the *Work* of the *Contractor* and connect as specified or shown in the *Contract Documents*.

S 3.2.3.5 Add new paragraph 3.2.3.5 as follows:

Subject to GC 9.4 . CONSTRUCTION SAFETY, for the *Owner's* own forces and for *Other Contractors,* assume overall responsibility for compliance with all aspects of the applicable health and safety legislation in force at the *Place of the Work*, including all of the responsibilities of the "constructor", pursuant to the *Occupational Health and Safety Act* (Ontario).

11. GC 3.3 TEMPORARY WORK

S GC 3.3.2 In paragraph 3.3.2, in the second line after the words "where required by law", insert "or the *Consultant*". Additionally, replace the world "law" with the words "*Applicable Law*".

12. GC 3.4 CONSTRUCTION SCHEDULE

S GC 3.4.1 Delete paragraph 3.4.1 in its entirety and replace with the following:
The Contractor shall:

1. within five (5) calendar days of receiving written confirmation of the award of the *Contract*, prepare and submit to the *Owner* and the *Consultant* for their review and acceptance, a construction schedule in the format indicated below that indicates the timing of the activities of the *Work* and provides sufficient detail of the critical events and their inter-relationship to demonstrate the *Work* will be performed in conformity with the *Contract Time* and in accordance with the *Contract Documents*. Such

schedule is to include a delivery schedule for *Products* whose delivery is critical to the schedule for the *Work* or are required by the *Contract* to be included in a *Products* delivery schedule. The *Contractor* shall employ construction scheduling software, being the latest version of .Microsoft *Project*., that permits the progress of the *Work* to be monitored in relation to the critical path established in the schedule. The *Contractor* shall provide the schedule and any successor or revised schedules in both electronic format and hard copy. Once accepted by the *Owner* and the *Consultant*, the construction schedule submitted by the *Contractor* shall become the baseline construction schedule; and,

2. provide the expertise and resources, such resources including manpower and equipment, as are necessary to maintain progress under the accepted baseline construction schedule or revised schedule accepted by the Owner pursuant to GC 3.4 - CONSTRUCTION SCHEDULE; and,

3. monitor the progress of the Work on a weekly basis relative to the baseline construction schedule, or any revised schedule accepted by the Owner pursuant to GC 3.4 - CONSTRUCTION SCHEDULE, update and submit to the Consultant and Owner the electronic and hard copy schedule on a monthly basis, at a minimum, or as required by the Consultant and advise the Consultant and the Owner weekly in writing of any variation from the baseline or slippage in the schedule; and,

4. provide overtime work without change to the Contract Price if such work is deemed necessary to meet the schedule; and,

5. ensure that the Contract Price shall include all costs required to phase or stage the Work.

S GC 3.4.2 Add new paragraph 3.4.2 as follows:

If, at any time, it should appear to the *Owner* or the *Consultant* that the actual progress of the *Work* is behind schedule or is likely to become behind schedule, or if the *Contractor* has given notice of such to the *Owner* or the *Consultant* pursuant to subparagraph 3.4.1.3, the *Contractor* shall, either at the request of the *Owner* or the *Consultant*, or following giving notice pursuant to subparagraph 3.4.1.3, take appropriate steps to cause the actual progress of the *Work* to conform to the schedule or minimize the resulting delay. Within five (5) calendar days of the request by the *Owner* or the *Consultant* or the notice being given pursuant to subparagraph 3.4.1.3, the *Contractor* shall produce and present to the *Owner* and the *Consultant* a plan demonstrating how the *Contractor* will achieve the recovery of the last accepted schedule.

S GC 3.4.3 Add new paragraph 3.4.3 as follows:

The *Contractor* is responsible for performing the *Work* within the *Contract Time*. Any schedule submissions revised from the accepted baseline construction schedule or revised schedule accepted by the *Owner* pursuant to GC 3.4 - CONSTRUCTION SCHEDULE, during construction are not deemed to be approved extensions to the *Contract Time*. All extensions to the *Contract Time* must be made in accordance with the *Contract Documents*.

13. GC 3.5 SUPERVISION

S GC 3.5.1 Delete paragraph 3.5.1 in its entirety and replace with the following:

The *Contractor* shall employ a competent full-time superintendent, acceptable to the *Owner* and *Consultant*, who shall be in full time attendance at the *Place of Work* while the *Work* is being performed. The superintendent shall not be changed by the *Contractor* without valid reason which shall be provided in writing and shall not be changed without prior consultation with and agreement by the *Owner* and the *Consultant*. The *Contractor* shall replace the superintendent within 7 *Working Days* of the *Owner's* written notification, if the superintendent's performance is not acceptable to the *Owner*. The *Contractor* shall provide the *Owner* and the *Consultant* with the names, addresses and telephone numbers of the superintendent referred to in this paragraph 3.5.1 and other responsible persons who may be contacted for emergency and other reasons during non-working hours.

S GC 3.5.2 Delete paragraph 3.5.2 in its entirely and replace with the following:

The superintendent, and any project manager appointed by the *Contractor*, shall represent the *Contractor* at the *Place of Work* and shall have full authority to act on written instructions given by the *Consultant* and/or the *Owner*. Instructions given to the superintendent or the project manager shall be deemed to have been given to the *Contractor* and both the superintendent and any project manager shall have full authority to act on behalf of the *Contractor* and bind the *Contractor* in matters related to the *Contract*.

S Add new paragraphs 3.5.3, 3.5.4, 3.5.5 and 3.5.6 as follows:

GC 3.5.3 The Owner may, at any time during the course of the Work, request the replacement of the appointed representative(s). Immediately upon receipt of the request, the Contractor shall make arrangements to appoint an acceptable replacement, which is approved by the Owner.

GC 3.5.4 The supervisory staff assigned to the Project shall also be fully competent to implement efficiently all requirements for scheduling, coordination, field engineering, reviews, inspections and submittals defined in the Specifications, and have minimum 5 years documented “Superintendent/Project Management” experience.

GC 3.5.5 The Consultant and Owner shall reserve the right to review the record of experience and credentials of supervisory staff assigned to the Project prior to commencement of the Work.

GC 3.5.6 A superintendent assigned to the Work shall be “Gold Seal Certified” as per the Canadian Construction Association; or a superintendent that can demonstrate the requisite experience and success related to the Project to the sole satisfaction of the Owner.

14. GC 3.6 SUBCONTRACTORS AND SUPPLIERS

S GC 3.6.1.1 In paragraph 3.6.1.1 add to the end of the second line “including any warranties and service agreements which extend beyond the term of the Contract”.

S GC 3.6.1.2 In subparagraph 3.6.1.2 after the words “the Contract Documents” insert the words “including any required surety bonding”.

S GC 3.6.2 Delete paragraph 3.6.2. in its entirety and replace with the following:

Substitution of any *Subcontractor* and/or Suppliers after submission of the *Contractor's* bid will not be accepted unless a valid reason is given in writing to and approved by the *Owner*, whose approval may be arbitrarily withheld. The reason for substitution must be provided to the *Owner* and to the original *Subcontractor* and/or Supplier and the *Subcontractor* and/or Supplier shall be given the opportunity to reply to the *Contractor* and *Owner*. The *Contractor* shall be fully aware of the capability of each *Subcontractor* and/or Supplier included in its bid, including but not limited to technical ability, financial stability and ability to maintain the proposed construction schedule.

S GC 3.6.4 In paragraph 3.6.4, change the word “shall” to “may” in the second line.

S Add new paragraphs 3.6.7 and 3.6.8 as follows:

GC 3.6.7 Where provided in the Contract, the Owner may assign to the Contractor, and the Contractor agrees to accept, any contract procured by the Owner for Work or services required on the Project that has been pre-tendered or pre-negotiated by the Owner, and upon such assignment, the Owner shall have no further liability to any party for such contract.

GC 3.6.8 The Contractor covenants that each subcontract or supply contract which the Contractor enters into for the purpose of performing the Work shall expressly provide for the assignment thereof to the Owner (at the option of the Owner) and the assumption by the Owner of the obligations of the Contractor thereunder, upon the termination of the Contract

and upon written notice by the Owner to the other parties to such subcontracts or supply contracts, without the imposition of further terms or conditions; provided, however, that until the Owner has given such notice, nothing herein contained shall be deemed to create any contractual or other liability upon the Owner for the performance of obligations under such subcontracts or supply contracts and the Contractor shall be fully responsible for all of its obligations and liabilities (if any) under such subcontracts and supply contracts.

15. GC 3.7 LABOUR AND PRODUCTS

S GC 3.7.1 Amend paragraph 3.7.1 by adding the words, "..., agents, Subcontractors and Suppliers". after the word "employees: in the first line.

S GC 3.7.3 Delete paragraph 3.7.3 and substitute with the following:

Products provided shall be new and shall conform to all current applicable specifications of the Canadian Standards Association, Canadian Standards Board or General Standards Board, ASTM, National Building Code, provincial and municipal building codes, fire safety standards, and all governmental authorities and regulatory agencies having jurisdiction at the *Place of the Work*, unless otherwise specified. *Products* which are not specified shall be of a quality consistent with those specified and their use acceptable to the *Consultant*. *Products* brought on to the *Place of the Work* by the *Contractor* shall be deemed to be the property of the *Owner*, but the *Owner* shall be under no liability for loss thereof or damage thereto arising from any cause whatsoever. The said *Products* shall be at the sole risk of the *Contractor*. *Work*manship shall be, in every respect, first class and the *Work* shall be performed in accordance with the best modern industry practice.

S Add new paragraphs 3.7.4, 3.7.5, 3.7.6, 3.7.7, 3.7.8 and 3.7.9 as follows:

GC 3.7.4 Upon receipt of a written notice from the Consultant, the Contractor shall immediately dismiss, from the Place of the Work, tradesmen and labourers whose Work is unsatisfactory to the Consultant or who are considered by the Consultant to be unskilled or otherwise objectionable.

GC 3.7.5 The Contractor shall cooperate with the Owner and its representatives and shall take all reasonable and necessary actions to maintain stable and harmonious labour relations with respect to the Work at the Place of the Work, including cooperation to attempt to avoid Work stoppages, trade union jurisdictional disputes and other Labour Disputes. Any costs arising from labour disputes shall be at the sole expense of the Contractor.

GC 3.7.6 The cost for overtime required beyond the normal Working Day to complete individual construction operations of a continuous nature, such as pouring or finishing of concrete or similar work, or Work that the Contractor elects to perform at overtime rates without the Owner requesting it, shall not be chargeable to the Owner.

GC 3.7.7 All manufactured Products which are identified by their proprietary names or by part or catalogue number in the Specifications shall be used by the Contractor. No substitutes for such specified Products shall be used without the written approval of the Owner and the Consultant. Substitutes will only be considered by the Consultant when submitted in sufficient time to permit proper review and investigation. When requesting approval for the use of substitutes, the Contractor shall include in its submission any proposed change in the Contract Price. The Contractor shall use all proprietary Products in strict accordance with the manufacturer's directions. Where there is a choice of proprietary Products specified for one use, the Contractor may select any one of the Products so specified for this use.

GC 3.7.8 No consideration will be given to claims by the Contractor of unsuitability or unavailability of any Products, nor to the Contractor's unwillingness to use, or to produce first class work with, any Products, or to provide the specified warranties or guarantees.

GC 3.7.9 Materials, appliances, equipment and other Products are sometimes specified by reference to brand names, proprietary names, trademarks or symbols. In such cases, the name of a manufacturer, distributor, Supplier or dealer is sometimes given to assist the Contractor to

find a source Supplier. This shall not relieve the Contractor from its responsibility from finding its own source of supply even if the source names no longer supplies the Product specified. If the Contractor is unable to obtain the specified Product, the Contractor shall supply a substitute product equal to or better than the specified Product, as approved by the Consultant with no extra compensation. Should the Contractor be unable to obtain a substitute Product equal to or superior to the specified Product and the Owner accepts a different Product, the Contract Price shall be adjusted accordingly, as approved by the Consultant.

16. GC 3.8 SHOP DRAWINGS

S GC 3.8.1 Delete paragraph 3.8.1 in its entirety and replace with the following:

The Contractor shall provide Shop Drawings as described in the Contract Documents and as the Consultant may reasonably request.

S GC 3.8.5 Delete paragraph 3.8.5 in its entirety and substitute the following:

At the time of providing Shop Drawings, the Contractor shall advise the Consultant in writing of any deviations in Shop Drawings from the requirements of the Contract Documents. The Consultant shall indicate the acceptance of such deviation expressly in writing. Where manufacturers. literature is submitted in lieu of scaled drawings, it shall be clearly marked in ink, to indicate the specific items for which review is requested.

S Add new paragraphs 3.8.3, 3.8.4, 3.8.5, and 3.8.6 and renumber the current paragraphs 3.8.3 to 3.8.6 accordingly:

GC 3.8.3 Upon request of the Contractor or the Consultant, they shall jointly prepare a schedule of the dates for provision, review and return of the Shop Drawings.

GC 3.8.4 The Contractor shall provide the Shop Drawings in the form specified, or if not specified, as directed by the Consultant.

GC 3.8.5 Shop Drawings provided by the Contractor to the Consultant shall indicate by stamp, date and signature of the person responsible for the review that the Contractor has reviewed each one of them.

GC 3.8.6 Shop Drawings which require approval of any lengthy constituted authority having jurisdiction shall be provided to such authority by the Contractor for approval.

S Add new paragraphs 3.8.12, 3.8.13, 3.8.14, 3.8.15, 3.8.16, 3.8.17, and 3.8.18 as follows:

GC 3.8.12 The Contractor shall provide revised Shop Drawings to correct those which the Consultant rejects as inconsistent with the Contract Documents, unless otherwise directed by the Consultant. The Contractor shall notify the Consultant in writing of any revisions to the Shop Drawings other than those requested by the Consultant.

GC 3.8.13 Reviewed Shop Drawings shall not authorize a change in the Contract Price and/or the Contract Time.

GC 3.8.14 The Contractor shall prepare a Shop Drawings schedule acceptable to the Owner and the Consultant prior to the first application for payment. A draft of the proposed Shop Drawings schedule shall be submitted by the Contractor to the Consultant and the Owner for approval. The draft Shop Drawings schedule shall clearly indicate the phasing of Shop Drawings submissions. The Contractor shall periodically re-submit the Shop Drawings schedule to correspond to changes in the construction schedule.

GC 3.8.15 Except where the parties have agreed to a different Shop Drawings schedule pursuant to paragraph 3.8.3, the Contractor shall comply with the requirements for Shop Drawings submissions stated in the Specifications.

GC 3.8.16 The Contractor shall not use the term “by others” on Shop Drawings or other submittals.

The related trade, Subcontractor or Supplier shall be stated.

GC 3.8.17 Certain Specifications sections require the Shop Drawings to bear the seal and signature of a professional engineer. Such professional engineer must be registered in the jurisdiction of the Place of the Work and shall have expertise in the area of practice reflected in the Shop Drawings.

GC 3.8.18 The Consultant will review and return Shop Drawings and submittals in accordance with the schedule agreed upon in paragraph 3.8.3, The Contractor shall allow the Consultant a minimum of 14 days to review Shop Drawings from the date of receipt. If resubmission of Shop Drawings is required, a further 14 day period is required for the Consultant's review.

17. GC 3.9 USE OF THE WORK

S Add new General Condition 3.9 - USE OF THE WORK

GC 3.9.1 The Contractor shall confine Construction Equipment, Temporary Work, storage of Products, waste products and debris, and operations of employees and Subcontractors to limits indicated by laws, ordinances, permits, by direction of the Owner or Consultant, or the *Contract Documents* and shall not unreasonably encumber the *Place of Work*.

GC 3.9.2 The Contractor shall not load or permit to be loaded any part of the Work with a weight or force that will endanger the safety of the Work.

GC 3.9.3 Add new paragraph 3.9.3 as follows:

The Owner shall have the right to enter or occupy the Work in whole or in part for the purpose of placing fittings and equipment, or for other use before Substantial Performance of the Work, if, in the opinion of the Consultant, such entry and occupation does not prevent or substantially interfere with the Contractor in the performance of the Contract within the Contract Time. Such entry or occupation shall neither be considered as acceptance of the Work, nor in any way relieve the Contractor from its responsibility to complete the Contract.

18. GC 3.10 CLEAN UP

S Add new General Condition 3.10 - CLEANUP:

GC 3.10.1 The Contractor shall maintain the Work in a safe and tidy condition and free from accumulation of waste products and debris, other than that caused by the Owner, Other Contractors or their employees. The Contractor shall remove accumulated waste and debris at least once a week as a minimum or as required by the nature of the Work.

GC 3.10.2 Before applying for the Substantial Performance of the Work as provided in GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK, the Contractor shall remove waste products and debris, other than that resulting from the work of the Owner, Other Contractors or their employees, and shall leave the Place of the Work clean and suitable for use or occupancy by the Owner. The Contractor shall remove products, tools, materials, Construction Equipment, and Temporary Work not required for the performance of the remaining work.

GC 3.10.3 Prior to application for the final payment, the Contractor shall remove any remaining products, tools, materials, Construction Equipment, Temporary Work, and waste products and debris, other than those resulting from the work of the Owner, Other Contractors or their employees.

GC 3.10.4 In the event that the Contractor fails to remove waste and debris as provided in this GC 3.10, then the Owner or the Consultant may give the Contractor twenty-four (24) hours written notice to meet its obligations respecting clean up. Should the Contractor fail to meet its obligations pursuant to this GC 3.10 within the twenty-four (24) hour period next following delivery of the notice, the Owner may remove such waste and debris and deduct from payments otherwise due to the Contractor, the Owner's costs for such clean up, including a

reasonable mark-up for administration costs.

GC 3.10.5 The Contractor shall clean up garbage during and after construction, and maintain the site in a neat and orderly condition on a daily basis. Prior to leaving the site at the end of construction, the Contractor shall make good all damage to the building and its components caused by the performance of the Work or by any Subcontractor or Supplier. The Contractor shall leave the site in a clean and finished state; remove all equipment and materials; remove all paint, stains, labels, dirt, etc. from the Work; and touch up all damaged painted areas.

GC 3.10.6 Without limitation to or waiver of the Owner's other rights and remedies, the Owner shall have the right to back charge to the Contractor the cost of damage to the site caused by transportation in and out of the site by the Contractor, Subcontractors or Suppliers, if not repaired before final payment.

GC 3.10.7 The Contractor shall dispose of debris at location and in a manner acceptable to the Owner, and authorities having jurisdiction in the area of the Work and the disposal area, and cover containers with tarpaulins tied in place to prevent scattering of debris on site and during transport.

19. GC 3.11 CONTRACTOR STANDARD OF CARE

S Add new General Condition 3.11 - CONTRACTOR STANDARD OF CARE as follows:

GC 3.11.1 In performing its services and obligations under the Contract, the Contractor shall exercise the standard of care, skill and diligence that would normally be provided by an experienced and prudent contractor supplying similar services for similar projects. The Contractor acknowledges and agrees that throughout the Contract, the performance of the Contractor's obligations, duties and responsibilities shall be judged against this standard. The Contractor shall exercise the same standard of care, skill and diligence in respect of any Products, personnel or procedures which it may recommend to the Owner.

GC 3.11.2 The Contractor further represents, covenants and warrants to the Owner that:

1. the personnel it assigns to the *Project* are appropriately experienced;

2. it has a sufficient staff of qualified and competent personnel to replace any of its appointed representatives, subject to the *Owner's* approval, in the event of death, incapacity, removal or resignation; and

3. there are no pending, threatened or anticipated claims, liabilities or contingent liabilities that would have a material effect on the financial ability of the *Contractor* to perform its work under the *Contract*.

20. GC 3.12 OCCUPANCY OF THE WORK

S Add new General Condition 3.12 - OCCUPANCY OF THE WORK as follows:

GC 3.12.1 The Owner reserves the right to take possession of and use for any intended purpose any portion or all of the undelivered portion of the Project even though the Work may not be substantially performed, provided that such taking possession and use will not interfere, in any material way, with the progress of the Work. The taking of possession or use of any such portion of the Project shall not be deemed to be the Owner's acknowledgement or acceptance of the Work or the Project, nor shall it relieve the Contractor of any of its obligations under the Contract.

GC 3.12.2 Whether the Project contemplates Work by way of renovations in buildings which will be in use or be occupied during the course of the Work or where the Project involves Work that is adjacent to a structure which is in use or is occupied, the Contractor, without in any way limiting its responsibilities under the Contract, shall take all reasonable steps to avoid interference with fire exits, building access and egress, continuity of electric power and all other utilities, to suppress dust and noise and to avoid conditions likely to propagate mould

or fungus of any kind and all other steps reasonably necessary to promote and maintain the safety and comfort of the users and occupants of such structures or adjacent structures.

21. GC 3.13 DOCUMENTS AT THE SITE

S Add new General Condition 3.13 - DOCUMENTS AT THE SITE as follows:

GC 3.13.1 The Contractor shall keep one copy of current Contract Documents, submittals, reports, and records of meetings at the Place of the Work, in good order and available to the Owner and the Consultant.

22. GC 3.14 CUTTING AND REMEDIAL WORK

S Add new General Condition 3.14 - CUTTING AND REMEDIAL WORK as follows:

3.14.1 The Contractor shall perform the cutting and remedial work required to make the affected parts of the Work come together properly.

3.14.2 The Contractor shall co-ordinate the Work to ensure that the cutting and remedial work is kept to a minimum.

3.14.3 Cutting and remedial work shall be performed by specialists familiar with the Products affected and shall be performed in a manner to neither damage nor endanger the work.

23. GC 4.1 CASH ALLOWANCES

S GC 4.1.1 Delete the second sentence in paragraph 4.1.1

S GC 4.1.4 Capitalize the word “overhead” in paragraph 4.1.4.

S Add new paragraphs 4.1.8 and 4.1.9 as follows:

GC 4.1.8 The Owner reserves the right to call, or to have the Contractor call, for competitive bids for portions of the Work, which are to be paid for from cash allowances.

GC 4.1.9 Cash allowances cover the net cost to the Contractor of services, Products, Construction Equipment, freight, unloading, handling, storage, installation, provincial sales tax, and other authorized expenses incurred in performing any Work stipulated under the cash allowances but does not include any Value Added Taxes payable by the Owner and the Contractor.

24. GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

S GC 5.1.1 Delete paragraph 5.1.1 in its entirety.

S GC 5.1.2 Delete paragraph 5.1.2 in its entirety.

25. GC 5.2 APPLICATIONS FOR PAYMENT

S GC 5.2.1 Add the following at the end of paragraph 5.2.1:

Each application for payment shall include the information required for a “*Proper Invoice*” in Section 6.1 of the *Construction Act* and the following information:

1. a declaration by the *Contractor* , in a form approved by the *Consultant*, verifying that the performance of the *Work* is in compliance with all applicable regulatory requirements respecting environmental protection, first safety, public safety and occupational health and safety;

2. invoices to support all claims against the cash allowance;

3. an acceptable construction schedule pursuant to GC 3.4;

4. the information set out in the Proper Invoice Checklist; and

5. any other information required by the Contract Documents or as the Consultant may direct.

If an application for payment does not include all information required by this paragraph 5.2.1, if any of the required confirmations made by the *Contractor* in its application for payment are untrue or if the *Contractor* is otherwise in breach of this *Contract*, it shall not be considered a "*Proper Invoice*" for the purposes of the *Construction Act* or this *Contract*. If the *Owner* or the *Consultant* determine that an application for payment does not constitute a *Proper Invoice*, the application for payment shall be rejected through a *Notice of Non- Payment* and the *Contractor* shall resubmit the application for payment with all required information. For clarity, the *Owner* shall have no obligation to make a payment and the time periods set out in this GC 5.2 and in Section 6.4 of the *Construction Act* shall not apply until the *Contractor* has submitted an application for payment that constitutes a *Proper Invoice*.

S GC 5.2.2 Delete paragraph 5.2.2 in its entirety and substitute the following:

Applications for payment shall be dated the last day of each payment period, which is the last day of the month or an alternative day of the month agreed in writing by the parties. The amount claimed shall be for the value, proportionate to the amount of the *Contract*, or work performed and *Products* delivered and incorporated into the Work at that date. No amount claimed shall include products delivered and incorporated into the work, unless the products are free and clear of all security interests, liens and other claims of third parties.

S GC 5.2.3 Amend paragraph 5.2.3 by adding the following to the end of that paragraph:

No amount claimed shall include *Products* delivered to the *Place of the Work* unless the *Products* are free and clear of all security interests, liens, and other claims of third parties.

S Delete existing paragraphs 5.2.7 and 5.2.8.

Add new paragraphs 5.2.7, 5.2.8, 5.2.9, 5.2.10 and 5.2.11 as follows:

GC 5.2.7 The Contractor shall prepare and maintain current As-Built Drawings which shall consist of the Drawings and Specifications revised by the Contractor during the Work, showing changes to the Drawings and Specifications, which current As-Built Drawings shall be maintained by the Contractor and made available to the Consultant for review with each application for progress payment. The Consultant shall retain a reasonable amount for the value of the As-Built Drawings not presented for review.

GC 5.2.8 Prior to each application for payment, the Contractor and the Consultant shall jointly review the progress of the *Work*.

GC 5.2.9 No later than five Working Days prior to the date of an application for payment, the Contractor shall submit to the Consultant a draft application for payment containing all information and drafts of all submittals required by GC 5.2.1. If the Consultant requires further evidence or supporting documentation, it shall direct the Contractor to include such information in its application for payment no later than three Working Days after receipt of a draft application for payment.

GC 5.2.10 Where the Contractor is required to perform start-up testing and/or commissioning activities in respect of a portion of the Work, an application for payment in respect of such portion of the Work may only be submitted once such testing and/or commissioning has been successfully completed by the Contractor as determined by the Consultant, including the submission of any related document. For clarity, an application for payment submitted prior to successful completion of required testing and/or commissioning shall not be considered a "Proper Invoice" for the purposes of the Construction Act and the Consultant shall not issue a certificate of payment in respect of such application for payment.

GC 5.2.11 If the Owner intends to exercise its right of set off pursuant to Article A-5.3 against a future payment, the Owner shall provide notice to the Contractor. Provided the Contractor receives such notice at least five Working Days prior to its submission of an application for payment, it shall include a separate line item setting out the amount the Owner has indicated it intends to set off from the payment.

S Delete GC 5.3 . PAYMENT in its entirety and replace with the following:

26. GC 5.3 PAYMENT

GC 5.3.1 After receipt by the Consultant and the Owner of an application for payment submitted by the Contractor in accordance with GC 5.2 - APPLICATIONS FOR PAYMENT:

1. the Consultant will issue to the Owner and copy to the Contractor, no later than 14 calendar days after the receipt of the application for payment, a certificate for payment in the amount applied for, or in such other amount as the Consultant determines to be properly due. If the Consultant issues a certificate for payment for an amount less than the full amount stated on the application for payment, the Consultant will issue a Notice of Non-Payment in respect of the disputed amount; And

2. the Owner shall make payment to the Contractor on account as provided in Article A-5 of the Agreement - PAYMENT in the amount set out in the certificate for payment on or before the day that is 28 calendar days following receipt by the Consultant of the application for payment.

GC 5.3.2 Payment to the Contractor will be made by electronic funds transfer.

27. GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK

S GC 5.4 Delete GC 5.4 - SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK in its entirety and replace it with the following:

GC 5.4.1 Prior to submitting its written application for Substantial Performance of the Work, the Contractor shall submit to the Consultant all:

1. guarantees;

2. warranties;

3. certificates;

4. final testing and balancing reports;

5. distribution system diagrams;

6. spare parts;

7. a complete manual for the operation and recommended maintenance of all systems, equipment, materials and finishes, and other similar concepts for use by the Owner;

8. samples;

9. reports and correspondence from authorities having jurisdiction in the Place of the Work;

10. Shop Drawings;

11. inspection certificates;

12. marked-up record or As-Built Drawings from the construction trailer;

and other materials or documentation required to be submitted under the Contract, together with written proof acceptable to the Owner and the Consultant that the Work has been substantially performed in conformance with the requirements of municipal, governmental, and utility authorities having jurisdiction in the Place of the Work. The Consultant shall refuse to certify Substantial Performance of the Work if the submittals referred to in this paragraph 5.4.1 are not provided by the Contractor.

GC 5.4.2 The Consultant will review the Work to verify the validity of the application for Substantial Performance of the Work and shall promptly, and in any event, no later than 30 calendar days after receipt of the Contractor's complete deficiency list and application, the Consultant shall:

1. prepare a final deficiency list incorporating all items to be completed or corrected. Each item is to have an indicated value for correction or completion. Determination of the value of items on the deficiencies list shall be made in accordance with GC 5.8.1. The final deficiency list complete with values is to be included with the Consultant's draft verification and shall be reviewed with the Owner prior to 5.4.2.2; and

2. having completed 5.4.2.1, the Consultant shall:
3.

a. advise the Contractor in writing that the Work or the designated portion of the Work is not substantially performed and give reasons why, or

b. state the date of Substantial Performance of the Work in a certificate and issue a copy of that certificate to each the Owner and the Contractor.

GC 5.4.3 The acceptance by the Contractor of the Substantial Performance of the Work certificate, or the acceptance of a certificate by a Subcontractor or for any payment due thereunder shall constitute a waiver by either the Contractor, or the Subcontractor, as the case may be, of all claims whatsoever against the Owner under this Contract or any trade contract whether for a change in the Contract Price, extension of Contract Time, or otherwise, except those made in writing prior to the Contractor's application for payment upon Substantial Performance of the Work and still unsettled.

GC 5.4.4 The Contractor shall conform to all requirements of Applicable Law in force in the jurisdiction of the Place of the Work with respect to publishing a copy of the Substantial Performance of the Work certificate. As applicable, the Contractor shall provide suitable evidence of the publication to the *Consultant* and *Owner*. If the *Contractor* fails to publish such notice and the publication of the notice is a requirement of *Applicable Law* in the *Place* of the *Work*, the *Owner* shall be at liberty to publish and back charge the *Contractor* its reasonable costs for doing so.

GC 5.4.5 After the issuance of the Substantial Performance of the Work certificate, the Contractor shall:

1. submit an application for payment of the holdback amounts, and the application by the *Contractor* shall be accompanied by:

a. a certificate, issued by an agency or firm providing workers. compensation insurance to the *Contractor*, verifying that coverage is in force at the time of making application for payment, and that coverage will remain in force for at least 60 days thereafter; and,

b. a declaration by the Contractor, in a form approved by the Consultant, verifying performance of the Work in compliance with all applicable regulatory requirements respecting environmental protection, fire safety, public safety and occupational health and safety;

c. a Statutory Declaration to state that all accounts for labour, subcontracts, Products, Construction Equipment, and other indebtedness which may have been incurred by the Contractor in the Substantial Performance of

the Work and for which the Owner might in any way be held responsible have been paid in full, except for amounts properly retained as a holdback or as an identified amount in dispute; and

d. a statement that no written notices of liens have been received by it.

GC 5.4.6 After the receipt of a complete application for payment of the holdback amounts from the Contractor, the Consultant will issue a certificate for payment of the holdback payments.

GC 5.4.7 Where legislation permits progressive release of the holdback for a portion of the Work and the Consultant has certified or verified that the part of the Work has been performed prior to Substantial Performance of the Work, the Owner may, in its sole discretion, release such portion to the Contractor in accordance with such legislation.

GC 5.4.8 Notwithstanding any progressive release of the holdback, the Contractor shall ensure that such parts of the Work are protected pending the issuance of a final certificate for payment and be responsible for the correction of defects or work not performed regardless of whether or not such was apparently when the holdback was released.

28. GC 5.5 FINAL PAYMENT

S GC 5.5.1 Delete paragraph 5.5.1 in its entirety and substitute as follows:

When the *Contractor* considers that the *Work* is completed, as defined in the lien legislation applicable to the *Place of the Work* or if such definition does not exist, in accordance with other applicable legislation, industry practice or provisions which may be agreed to between the parties, the *Contractor* shall submit an application for final payment. The *Contractor's* application for final payment shall be accompanied by any documents or materials not yet delivered pursuant to paragraph 5.4.1, together with complete and final *As-Built Drawings* and:

1. all of the requirements for an application for payment as set out in paragraph 5.2.1.

2. the *Contractor's* written request for release of the deficiency holdback; and

3. the evidence of workers. compensation compliance required by paragraph 10.4.1.

The *Work* shall be deemed not to be completed until all of the aforementioned documents have been delivered, and the *Owner* may withhold payment in respect of the delivery of any documents in an amount determined by the *Consultant* in accordance with the provisions of GC 5.6 - DEFERRED WORK.

S Delete the entirety of paragraphs 5.5.2, 5.5.3 and 5.5.4 and substitute the following new paragraphs 5.5.2, 5.5.3 and 5.5.4:

GC 5.5.2 The Consultant will issue to the Owner and copy to the Contractor, no later than 14 calendar days after the receipt of the application for final payment, a certificate for payment in the amount applied for, or in such other amount as the Consultant determines to be properly due. If the Consultant issues a certificate for payment for an amount less than the full amount stated on the application for final payment or does not issue a certificate for payment, the Consultant will issue a Notice of Non-Payment in respect of the disputed amount.

GC 5.5.3 Subject to the provision of paragraph 10.4.1 of GC 10.4 - WORKERS' COMPENSATION, and any lien legislation applicable to the Place of the Work, the Owner shall make payment to the Contractor on account as provided in Article A-5 of the Agreement - PAYMENT in the amount set out in the certificate for payment on or before the day that is 28 calendar days following receipt by the Consultant of the application for final payment.

GC 5.5.4 The Contractor shall submit, with the application for final payment upon total completion, a written statement that the Work has been performed to the requirements of the Contract

Documents, and itemizing approved changes in the Work and the Consultant's written instructions and modifications indicated by the Governmental Authorities having jurisdiction and such other materials or documentation as may be required to be submitted under the Contract Documents.

GC 5.6 DEFERRED WORK

S GC 5.6.1 Delete paragraph 5.6.1 and replace with the following:

If because of conditions reasonably beyond the control of the *Contractor*, there are items of work that cannot be performed, payment in full for that portion of the *Work* which has been performed as certified by the *Consultant* shall not be withheld or delayed by the *Owner* on account thereof, but the *Owner* may withhold, until the remaining portion of the *Work* is finished, only such an amount that the *Consultant* determines is sufficient and reasonable to cover the cost of performing such remaining work and will do so by issuing a *Notice of Non-Payment* in respect of the disputed amount.

S GC 5.6.2 Add a new paragraph 5.6.2 as follows:

If the *Owner* intends to exercise its right to withhold payment pursuant to GC 5.6.1, it may provide notice to the *Contractor*. Provided the *Contractor* receives such notice at least five *Working Days* prior to its submission of an application for payment, it shall include a separate line item setting out the amount the *Owner* has indicated it intends to withhold from the payment. If the *Owner* does not provide such notice, it may withhold amounts in accordance with this GC 5.6 from any payment and issue a *Notice of Non-Payment* in respect of the amount withheld in accordance with GC 5.6.1.

29. GC 5.8 DEFICIENCY HOLDBACK

S Add new General Condition 5.8 - DEFICIENCY HOLDBACK:

GC 5.8.1 Notwithstanding any provisions contained in the Contract Documents concerning certification and release of monies to the Contractor, the Owner reserves the right to establish a deficiency holdback, at the time of the review for Substantial Performance of the Work, based on a 200% dollar value of the deficiencies listed by the Consultant. The value of work outstanding for the calculation of Substantial Performance of the Work under the Construction Act shall utilize this 200% dollar value. No individual deficiency will be valued at less than two hundred dollars ($200.00). The Owner shall retain the entire deficiency holdback amount until completion of all of the deficiencies listed by the Consultant to the satisfaction of the Consultant. The Owner shall notify the Contractor of the amount of the deficiencies holdback it intends to withhold in accordance with this GC 5.8.1 with the issuance of the certificate of Substantial Performance of the Work and the Contractor shall include a separate line item setting out the amount of the deficiencies holdback in its application for payment submitted pursuant to GC 5.4.5.

30. GC 5.9 RIGHT TO DISPUTE AMOUNTS

S GC 5.9.1 Add new General Condition 5.9 - RIGHT TO DISPUTE AMOUNTS

The *Owner* may, in its sole discretion, pay amounts to the *Contractor* that have not been certified by the *Consultant* for any reason. Any payment by the *Owner* shall not constitute acceptance of any portion of the *Work* or *Products* which are not in accordance with the requirements of the *Contract Documents* or acceptance by the *Owner* of any amounts set out in an application for payment. The *Owner* reserves the right to dispute any amounts set out in an application for payment at any time during the *Contract Time*, whether or not it has previously made a payment in respect of such amounts.

31. GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

S Add new paragraphs 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.1.7 and 6.1.8 as follows:

GC 6.1.3 The Contractor agrees that changes resulting from construction coordination, including but not limited to, site surface conditions, site coordination, and Subcontractor and Supplier coordination are included in the Contract Price and the Contractor shall be precluded from making any claim for a change in the Contract Price as a result of such changes.

GC 6.1.4 Labour costs shall be actual, prevailing rates at the Place of the Work paid to workers, plus statutory charges on labour including WSIB, unemployment insurance, Canada pension, vacation pay, hospitalization and medical insurance. The Contractor shall provides these rates, when requested by the Consultant, for review and/or agreement.

GC 6.1.5 Quotations for changes to the Work shall be accompanied by itemized breakdowns together with detailed, substantiating quotations or cost vouchers from Subcontractors and Suppliers, submitted in a format acceptable to the Consultant and including any costs associated with extensions in Contract Time.

GC 6.1.6 When both additions and deletions covering related Work or substitutions are involved in a change to the Work, payment, including Overhead and profit, shall be calculated on the basis of the net difference, if any, with respect to that change in the Work.

GC 6.1.7 No extension to the Contract Time shall be granted for changes in the Work unless the Contractor can clearly demonstrate that such changes significantly alter the overall construction schedule submitted at the commencement of the Work. Extensions of Contract Time and all associated costs, if approved pursuant to GC 3.4.3, are to be included in the relevant Change Order.

GC 6.1.8 When a change in the Work is proposed or required, the Contractor shall within 10 calendar days submit to the Consultant for review a claim for a change in Contract Price and/or Contract Time. Should 10 calendar days be insufficient to prepare the submission, the Contractor shall within 5 calendar days, advise the Consultant in writing of the proposed date of submission of the claim. Claims submitted after the dates prescribed herein will not be considered.

32. GC 6.2 CHANGE ORDER

S GC 6.2.1 Add after the last sentence in the paragraph:

The adjustment in the *Contract Time* and the *Contract Price* shall include an adjustment, if any, for delay or for the impact that the change in the *Work* has on the *Work* of the *Contractor*, and once such adjustment is made, the *Contractor* shall be precluded from making any further claims for delay or impact with respect to the change in the *Work*.

S GC 6.2.3 Add new paragraph 6.2.3 as follows:

The value of a change shall be determined in one or more of the following methods as directed by the *Consultant*.

1. by estimate and acceptance of a lump sum;

2. by negotiated unit prices which include the Contractor's Overhead and profit, or;

3. by the actual cost to the Owner, such costs to be the actual cost after all credits included in the change have been deducted, plus the following ranges of mark-up on such costs:

    a. or *Change Orders* with a value of $0 to $15,000 the total *Subcontractor*/Supplier mark-up including *Overhead* and profit shall be10% and the total *Contractor* mark-up including overhead and profit shall be 5%.

    b. For *Change Orders* in excess of $15,000, the total *Subcontractor*/Supplier mark-up including *Overhead* and profit shall be 5% and the total *Contractor* mark-up including *Overhead* and profit shall be 3%.

S GC 6.2.4 Add new paragraph 6.2.4 as follows:

All quotations will be submitted in a complete manner listing:

1. quantity of each material,
2. unit cost of each material,
3. man hours involved,
4. cost per hour,
5. Subcontractor quotations submitted listing items 1 to 4 above and item 6 below.
6. mark-up

S GC 6.2.5 Add new paragraph 6.2.5 as follows:

The *Owner* and the *Consultant* will not be responsible for delays to the *Work* resulting from late, incomplete or inadequately broken down valuations submitted by the *Contractor*.

33. GC 6.3 CHANGE DIRECCTIVE

S GC 6.3.6 Amend paragraph 6.3.6 by deleting the final period and adding as follows:

.4 Ten percent (10%) for profit plus five percent (5%) for overhead on work by the *Contractor's* own forces up to the value of $15,000 and five percent (5%) for profit plus three percent (3%) for *Overhead* on work by the *Contractor's* own forces in excess of $15,000 and,

.5 Ten percent (10%) fee on amounts paid to *Subcontractors* or *Suppliers* under subparagraph 6.3.7.6 for changes up to the value of $15,000 and five percent (5%) on changes over $15,000.

Unless a *Subcontractor*'s or *Supplier's* price has been approved by the *Owner*, the *Subcontractor* or *Supplier* shall be entitled to its actual net cost as determined in accordance with paragraph 6.3.7, plus ten percent (10%) for profit and five percent (5%) for *Overhead* on such actual net cost for changes in the *Work*, up to the value of $15,000 and five percent (5%) for profit and three percent (3%) for overhead on such actual net cost changes in the *Work* in excess of $15,000.

S GC 6.3.6.2 Delete paragraph 6.3.6.2 and replace it with the following:

If a change in the *Work* results in a net decrease in the *Contract Price* in excess of $15,000 the amount of the credit shall be the net cost, with deduction for *Overhead* and profit. If a change in the *Work* results in a net decrease in the *Contract Price* of $15,000 or less, the amount of the credit shall be the net cost, without deduction for *Overhead* or profit.

S GC 6.3.7 In subparagraph 6.3.7 insert .while directly engaged in the work attributable to the change. after the words "in the direct implementation of the *Change Directive*".

S GC 6.3.7 At the end of paragraph 6.3.7 add the following:

All other costs attributable to the change in the *Work* including the costs of all administrative or supervisory personnel are included in *Overhead* and profit calculated in accordance with the provisions of paragraph 6.1.6 of GC 6.1 - OWNER'S RIGHT TO MAKE CHANGES.

34. GC 6.4 CONCEALED OR UNKOWN CONDITIONS

S GC 6.4.1 Delete paragraph 6.4.1 and replace with the following:

GC 6.4.1.1 Prior to the submission of the bid on which the Contract was awarded, the Contractor confirms that it carefully investigated the Place of the Work and carried out such tests as it deemed appropriate and, in doing so, applied to that investigation the degree of care and skill required by paragraph 3.11.1.

GC 6.4.1.2 The Contractor is deemed to assume all risk of conditions or circumstances now existing or arising in the course of the Work which could make the work more expensive or more difficult to perform than was contemplated at the time the Contract was executed. No claim by the Contractor will be considered by the Owner or the Consultant in connection with conditions which could reasonably have been ascertained by such investigation or other due diligence undertaken prior to the execution of the Contract.

S GC 6.4.2 Amend paragraph 6.4.2 by adding a new first sentence as follows:

Having regard to paragraph 6.4.1, if the *Contractor* believes that the conditions of the *Place of the Work* differ materially from those reasonably anticipated, differ materially from those indicated in the *Contract Documents* or were concealed from discovery notwithstanding the conduct of the investigation described in paragraph 6.4.1, it shall provide the *Owner* and the *Consultant* with *Notice in Writing* no later than five (5) *Working Days* after the first observation of such conditions.

Amend the existing second sentence of paragraph 6.4.2 in the second line, following the word .materially. by adding the words “or were concealed from discovery notwithstanding the conduct of the investigation described in paragraph 6.4.1,”

S GC 6.4.3 Delete paragraph 6.4.3 in its entirety and substitute the following:

If the *Consultant* makes a finding pursuant to paragraph 6.4.2 that no change in the *Contract Price* or the *Contract Time* is justified, the *Consultant* shall report in writing the reasons for this finding to the *Owner* and the *Contractor*.

S GC 6.4.5 Add a new paragraph 6.4.5. as follows:

No claims for additional compensation or for an extension of *Contract Time* shall be allowed if the *Contractor* fails to give *Notice in Writing* to the *Owner* or *Consultant*, as required by paragraph 6.4.2.

35. GC 6.5 DELAYS

S GC 6.5.1 Delete the words after the word “for” in the fourth line of paragraph 6.5.1, and add the words “reasonable direct costs directly flowing from the delay, but excluding any consequential, indirect or special damages (including, without limitation, loss of profits, loss of opportunity or loss of productivity).”

S GC 6.5.2 Delete the words after the word “for” in the fourth line of paragraph 6.5.2, and add the words “.reasonable direct costs directly flowing from the delay, but excluding any consequential, indirect or special damages (including, without limitation, loss of profits, loss of opportunity or loss of productivity).”

S GC 6.5.3 Delete paragraph 6.5.3 in its entirety and replace with the following:

If the Contractor is delayed in the performance of the Work by Force Majeure, then the Contract Time shall be extended for such reasonable time as the Consultant may recommend in consultation with the Contractor. The extension of time shall not be less than the time lost as a result of the event causing the delay, unless the Contractor agrees to a shorter extension. The Contractor shall not be entitled to payment for costs incurred by such delays unless such delays result from the actions of the Owner.

S GC 6.5.4 Delete paragraph 6.5.4 in its entirety and replace with the following:

No extension or compensation shall be made for delay or impact on the Work unless Notice in Writing of a claim is given to the Consultant not later than ten (10) Working Days after the commencement of the delays or impact on the Work, provided however, that, in the case of a continuing cause of delay or impact on the Work, only one notice of claim shall be necessary.

S Add new paragraphs 6.5.6, 6.5.7 and 6.5.8 as follows:

GC 6.5.6 If the Contractor is delayed in the performance of the Work by an act or omission of the Contractor or anyone directly or indirectly employed or engaged by the Contractor, or by any cause within the Contractor's control, then the Contract Time may be extended for such reasonable time as the Owner may decide in consultation with the Consultant and the Contractor. The Owner shall be reimbursed by the Contractor for all reasonable costs incurred by the Owner as the result of such delay, including, but not limited to, the cost of all additional services required by the Owner from the Consultant or any sub-consultants, project managers, or others employed or engaged by the Owner, and in particular, the costs of the Consultant's services during the period between the date of Substantial Performance of the Work stated in Article A-1 herein, as the same may be extended through the provision of these General Conditions, and any later or actual date of Substantial Performance of the Work achieved by the Contractor.

GC 6.5.7 Without limiting the obligations of the Contractor described in GC 3.2 - CONSTRUCTION BY OWNER OR OTHER CONTRACTORS or GC 9.4 - CONSTRUCTION SAFETY, the Owner or Consultant may, by Notice in Writing, direct the Contractor to stop the Work where the Owner or Consultant determines that there is an imminent risk to the safety of persons or property at the Place of the Work. In the event that the Contractor receives such notice, it shall immediately stop the Work and secure the site. The Contractor shall not be entitled to an extension of the Contract Time or to an increase in the Contract Price unless the resulting delay, if any, would entitle the Contractor to an extension of the Contact Time or the reimbursement of the Contractor's costs as provided in paragraphs 6.5.1, 6.5.2 or 6.5.3.

GC 6.5.8 No claim for delay shall be made and the Contract Time shall not be extended due to climatic conditions or arising from the Contractor's efforts to maintain the Contract schedule.

GC 6.6 CLAIMS FOR A CHANGE IN THE CONTRACT PRICE

1. Add the words "as noted in paragraph 6.6.3" after the words "of the claim " in paragraph 6.6.5 and add the words "and the Consultant", at the end of paragraph 6.6.5.

2. Add new paragraph 6.6.7:

"6.6.7 The Owner may make claims arising out of the costs incurred for additional services provided by the Consultant resulting from the Contractor's failure to reasonably perform the Work in accordance with the terms and conditions of the Contract, including the Contractor's issuance of unnecessary Requests for Information. The Consultant will notify the Owner and Contractor where it has been determined that additional services will be required or have been provided in order not to cause a delay. The Owner shall make claims based on the Consultant's invoices."

36. GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT

S GC 7.1 Revise the heading to read "OWNER.S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT"

S GC 7.1.2 Delete paragraph 7.1.2 and replace with the following:

If the *Contractor* should neglect to prosecute the *Work* properly, fails or neglects to maintain the latest schedule provided pursuant to GC 3.4, or otherwise fails to comply with the requirements of the *Contract*, and if the *Consultant* has given a written statement to the *Contractor* that sufficient cause exists to justify such action, the *Owner* may notify the *Contractor*, in writing, that the *Contractor* is in default of the *Contractor's* contractual obligations and instruct the *Contractor* to correct the default in the five (5) *Working Days* immediately following the receipt of such notice.

S GC 7.1.3.4 Add new subparagraph 7.1.3.4 as follows:

An “acceptable schedule” as referred to in subparagraph 7.1.3.2. means a schedule approved by the Consultant and the Owner wherein the default can be corrected within the balance of the Contract Time and shall not cause delay to any other aspect of the Work or the work of Other Contractors, and in no event shall it be deemed to give a right to extend the Contract Time.

S GC 17.1.4.1 Delete sentence and replace with the following:

Correct such default and deduct the cost, including Owner’s expenses, thereof from any payment then or thereafter due the Contractor.

S GC 7.1.5.3 In subparagraph 7.1.5.3 delete the words: “however, if such cost of finishing the Work is less than the unpaid balance of the Contract Price, the Owner shall pay the Contractor the difference;”

S Delete paragraph 7.1.6 in its entirety and add new paragraphs 7.1.6, 7.1.7, 7.1.8, 7.1.9 and 7.1.10 as follows:

GC 7.1.6 In addition to its right to terminate the Contract set out herein, the Owner may terminate this Contract at any time for any other reason and without cause upon giving the Contractor fifteen (15) Working Days Notice in Writing to that effect. In such event, the Owner shall pay to the Contractor:

1. the portion of the Contract Price applicable to the Work performed up to the date of termination that has not previously been paid to the Contractor as determined by the Consultant, and

2. all of the Contractor’s reasonable and direct out-of-pocket costs of effecting the termination (without mark-up), including documented demobilization costs and subcontract cancellation charges with arm’s -length Subcontractors (with respect to which Contractor agrees to mitigate such cancellation charges), provided that Contractor supplies Owner with invoices, information and other documentation as requested by the Owner to support these payments, but in no event shall the Contractor be entitled to be compensated for any loss of profit on unperformed portions of the Work, or indirect, special, or consequential damages incurred.

GC 7.1.7 The Owner may suspend Work under this Contract at any time for any reason and without cause upon giving the Contractor Notice in Writing to that effect. In such event, the Contractor shall be entitled to be paid for all Work performed to the date of suspension and be compensated for all actual costs incurred arising from the suspension, including reasonable profit, for loss sustained upon Products and Construction Equipment, and such other damages as the Contractor may have sustained as a result of the suspension of the Work, but in no event shall the Contractor be entitled to be compensated for any indirect, special, or consequential damages incurred. In the event that the suspension continues for more than thirty (30) calendar days, the Contract shall be deemed to be terminated and the provisions of paragraph 7.1.6 shall apply.

GC 7.1.8 In the case of either a termination of the Contract or a suspension of the Work under GC 7.1 - OWNER’S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR’S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK, OR TERMINATE THE CONTRACT or GC 7.2 – CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the Contractor shall use its best commercial efforts to mitigate the financial consequences to the Owner arising out of the termination or suspension, as the case may be.

GC 7.1.9 Upon the resumption of the Work following a suspension under GC 7.1 - OWNER’S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR’S RIGHT TO CONTINUE WITH THE WORK, SUSPEND THE WORK OR TERMINATE THE CONTRACT or GC 7.2 - CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the Contractor will endeavour to minimize the delay and financial consequences arising out of the suspension.

GC 7.1.10 The Contractor's obligations under the Contract as to quality, correction, and warranty of the Work performed by the Contractor up to the time of termination or suspension shall continue after such termination of the Contract or suspension of the Work.

37. GC 7.2 CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

S GC 7.2.2 Delete paragraph 7.2.2 in its entirety.

S GC 7.2.3.1 Delete subparagraph 7.2.3.1 in its entirety.

S GC 7.2.3.2 Delete subparagraph 7.2.3.2 in its entirety.

S GC 7.2.3.3 Delete subparagraph 7.2.3.3 in its entirety.

S GC 7.2.3.4 In subparagraph 7.2.3.4, delete the words "except for GC 5.1 - FINANCING INFORMATION REQUIRED OF THE OWNER".

S GC 7.2.5 Delete paragraph 7.2.5 in its entirety and replace it with the following:

If the default cannot be corrected within the 5 *Working Days* specified in paragraph 7.2.4, the *Owner* shall be deemed to have cured the default if it:

1. commences correction of the default within the specified time;

2. provides the Contractor with an acceptable schedule for such correction; and,

3. completes the correction in accordance with such schedule.

S Add new paragraphs 7.2.6, 7.2.7, 7.2.8 and 7.2.9 as follows:

GC 7.2.6 If the Contractor terminates the Contract under the conditions described in GC 7.2 - CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the Contractor shall be entitled to be paid for all Work performed to the date of termination, as determined by the Consultant. The Contractor shall also be entitled to recover the direct costs associated with termination, including the costs of demobilization and losses sustained on Products and Construction Equipment. The Contractor shall not be entitled to any recovery for any special, indirect or consequential losses, including loss of profit.

GC 7.2.7 The Contractor shall not be entitled to give notice of the Owner's default or terminate the Contract in the event the Owner withholds certificates or payment or both in accordance with the Contract because of:

(a) the Contractor's failure to pay all legitimate claims promptly, or

(b) the failure of the Contractor to discharge construction liens which are registered against the title to the Place of the Work.

GC 7.2.8 The Contractor's obligations under the Contract as to quality, correction and warranty of the Work performed by the Contractor up to the effective date of termination shall continue in force and shall survive termination by the Contractor in accordance with paragraph 7.2.4.

GC 7.2.9 If the Contractor suspends the Work or terminates the Contract as provided for in GC 7.2 - CONTRACTOR'S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT, the Contractor shall ensure the site and the Work are left in a safe, secure condition as required by authorities having jurisdiction at the Place of the Work and the Contract Documents.

38. GC 8.1 AUTHORITY OF THE CONSULTANT

S GC 8.1.1 Add the following to the beginning of paragraph 8.1.1:

"Unless either party has referred a matter to adjudication pursuant to Section 13.5 of the *Construction Act*,"

S GC 8.1.2 Delete 8.1.2 in its entirety and replace it with the following new 8.1.2:

If a dispute arises under the *Contract* in respect of a matter in which the *Consultant* has no authority under the *Contract* to make a finding, and provided that neither party has referred a matter to adjudication pursuant to Section 13.5 of the *Construction Act*, the procedures set out in paragraphs 8.3.3 to 8.3.8 of GC 8.3 - NEGOTIATION, MEDIATION AND ARBITRATION, and in GC 8.4 - RETENTION OF RIGHTS apply to that dispute with the necessary changes to detail as may be required.

S GC 8.1.3 Delete entire paragraph.

39. GC 8.2 ADJUDICATION

S GC 8.2.2 Add the following new paragraph 8.2.2:

Either party may refer a matter set out in Section 13.5(1) of the *Construction Act* to adjudication pursuant to Part II.1 of the *Construction Act*. The parties agree that no other matter may be referred to adjudication unless the parties agree in writing.

S GC 8.2.3 Add the following new paragraph 8.2.3:

The parties agree that no other matter may be referred to adjudication unless the parties agree in writing. The parties agree and consent that any *Construction Act Document* may be sent to the other party and any adjudicator via electronic mail and that service of such *Construction Act Documents* will be effective at the time and date of sending, except that where an electronic mail message is sent after 4:00 p.m. Eastern Time, service of such *Construction Act Documents* will be deemed to be effective the following day. The e-mail message to which a *Construction Act Document* is attached shall include the sender's name, address, telephone number and the name and telephone number of a person to contact in the event of a transmission problem. Any *Construction Act Documents* shall be served in accordance with this section unless the parties subsequently agree otherwise in writing or an adjudicator directs otherwise.

40. GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION

S GC 8.3.1 Amend paragraph 8.3.1 by changing part of the second line from "shall appoint a *Project Mediator*" to "may appoint a *Project Mediator*, except that such an appointment shall only be made if both the *Owner* and the *Contractor* agree."

S GC 8.3.4 Amend paragraph 8.3.4 by changing part of the second line from "the parties shall request the *Project Mediator*" to "and subject to paragraph 8.2.1 the parties may request the *Project Mediator*."

S Delete paragraphs 8.3.6, 8.3.7 and 8.3.8 in their entirety.

Add new paragraph 8.3.6 as follows:

GC 8.3.6 The dispute may be finally resolved by arbitration under the Rules for Arbitration of Construction Disputes as provided in CCDC 40 in effect at the time of bid closing, provided that both the Contractor and the Owner agree. If the Contractor and the Owner agree to resolve the dispute by arbitration, the arbitration shall be conducted in the jurisdiction of the Place of the Work.

41. GC 9.1 PROTECTION OF WORK AND PROPERTY

S GC 9.1.1.1 Delete subparagraph 9.1.1.1 in its entirety and substitute the following:
errors or omissions in the *Contract Documents* which the *Contractor* could not have

discovered applying the standard of care described in paragraph 3.11.1;

S GC 9.1.2 Delete paragraph 9.1.2 in its entirety and substitute as follows:

Before commencing any *Work*, the *Contractor* shall determine the locations of all underground or hidden utilities and structures indicated in or inferable from the *Contract Documents*, or that are inferable from an inspection of the *Place of the Work* exercising the degree of care and skill described in paragraph 3.11.1.

S GC 9.1.5 Add new paragraph 9.1.5 as follows:

With respect to any damage to which paragraphs 9.1.3 or 9.1.4 apply, the *Contractor* shall neither undertake to repair or replace any damage whatsoever to the work of *Other Contractors,* or to adjoining property, nor acknowledge that the same was caused or occasioned by the *Contractor*, without first consulting the *Owner* and receiving written instructions as to the course of action to be followed from either the *Owner* or the *Consultant*. Where, however, there is danger to life, the environment, or public safety, the *Contractor* shall take such emergency action as it deems necessary to remove the danger.

42. GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

S GC 9.2.5.5 Add new subparagraph 9.2.5.5 as follows:

in addition to the steps described in subparagraph 9.2.5.3, take any further steps it deems necessary to mitigate or stabilize any conditions resulting from encountering toxic or hazardous substances or materials

S GC 9.2.6 Add the following to paragraph 9.2.6, after the word .responsible. in the second line:

..or whether any toxic or hazardous substances or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the *Contractor* or anyone for whom the *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damages to the property of the *Owner* or others,..

S GC 9.2.7 Delete subparagraph 9.2.7.4 in its entirety.

S GC 9.2.8 Add the following to paragraph 9.2.8, after the word .responsible. in the second line:

..or whether any toxic or hazardous substances or materials already at the *Place of the Work* (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the *Contractor* or anyone for whom the *Contractor* is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damages to the property of the *Owner* or others,..

S GC 9.2.10 The *Contractor*, *Subcontractors* and Suppliers shall not bring on to the *Place of the Work* any toxic or hazardous substances and materials except as required in order to perform the *Work*. If such toxic or hazardous substances or materials are required, storage in quantities sufficient to allow work to proceed to the end of any current work week only shall be permitted. All such toxic and hazardous materials and substances at the *Place of the Work* shall be handled and disposed of only in accordance with all *Applicable Law*.

S GC 9.2.11 The *Contractor* shall indemnify and hold harmless the *Owner*, its parent, subsidiaries and affiliates, the *Consultant* and their respective partners, officers, directors, agents and employees from and against any and all liabilities, costs, expenses, and claims resulting from bodily injury, including death, and damage to property of any person, corporation or other body politic, that arises from the use by the *Contractor*, *Subcontractors* and Suppliers of any toxic or hazardous substances or materials at the *Place of the Work*.

43. GC 9.4 CONSTRUCTION SAFETY

S Delete paragraphs 9.4.1 to 9.4.5 in their entirety and substitute as follows:

GC 9.4.1 The Contractor shall be solely responsible for construction safety at the Place of the Work and for compliance with the rules, regulations and practices required by the applicable construction health and safety legislation and shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Work. The Contractor shall assume overall responsibility, carry out and discharge all duties and obligations of, and be designated or registered as the "prime contractor", "constructor" or equivalent role with respect to the health and construction safety legislation applicable to the Place of the Work and the Project, including responsibility for all health and safety at the Place of the Work and over the Owner and Other Contractors. In order to effectively exercise that responsibility, the Owner authorizes the Contractor to supervise the Owner's own forces at the Place of the Work with respect to applicable health and construction safety matters and, where reasonably necessary due to health or construction safety considerations, deny the Owner's own forces or Other Contractors access to the Place of Work.

GC 9.4.2 Prior to the commencement of the Work, the Contractor shall submit to the Owner:

1. the evidence of workers. compensation compliance required by GC 10.4.1;

2. copies of the Contractor's insurance policies having application to the Project or certificates of insurance, at the option of the Owner;

3. documentation setting out the Contractor's in-house safety programs;

4. copies of any documentation or notices to be filed or delivered to the authorities having jurisdiction for the regulation of occupational health and safety at the Place of the Work.

GC 9.4.3 The Contractor shall indemnify and save harmless the Owner, its agents, trustees, officers, directors, employees, consultants, successors, appointees, and assigns from and against the consequences of any and all safety infractions committed by the Contractor under the occupational health and safety legislation in force at the Place of the Work including the payment of legal fees and disbursements on a substantial indemnity basis.

GC 9.4.4 The Owner undertakes to include in its contracts with Other Contractors and in its instructions to its own forces the requirement that the Other Contractor or its own forces, as the case may be, comply with the policies and procedures of and the directions and instructions from the Contractor with respect to occupational health and safety and related matters.

GC 9.4.5 If the Owner is of the reasonable opinion that the Contractor has not taken such precautions as are necessary to ensure compliance with the requirements of paragraph 9.4.1, the Owner may take any remedial measures which it deems necessary, including stopping the performance of all or any portion of the Work, and the Owner may use its employees, the Contractor, any Subcontractor or any Other Contractors to perform such remedial measures.

GC 9.4.6 The Contractor shall file any notices or any similar document required pursuant to the Contract or the safety regulations in force at the Place of the Work. This duty of the *Contractor* will be considered to be included in the *Work* and no separate payment therefore will be made to the *Contractor*.

GC 9.4.7 Unless otherwise provided in the Contract Documents, the Contactor shall develop, maintain and supervise for the duration of the Work a comprehensive safety program that will effectively incorporate and implement all required safety precautions. The program shall, at a minimum, respond fully to the applicable safety regulations and general construction practices for the safety of persons or property, including, without limitation, any general

safety rules and regulations of the Owner and any workers. compensation or occupational health and safety statutes or regulations in force at the Place of the Work.

GC 9.4.8 The Contractor shall provide a copy of the safety program described in paragraph 9.4.7 hereof to the Consultant for delivery to the Owner prior to the commencement of the Work, and shall, ensure, as far as it is reasonably practical to do so, that every employer and worker performing work in respect of the Project complies with such program.

GC 9.4.9 The Contractor shall arrange regular safety meetings, and shall supply and maintain, at its own expense, at its office or other well-known place at the job site, safety equipment necessary to protect the workers and general public against accident or injury as prescribed by the authorities having jurisdiction at the Place of the Work, including, without limitation, articles necessary for administering first-aid to any person and an emergency procedure for the immediate removal of any inured person to a hospital or a doctor's care.

GC 9.4.10 The Contractor shall promptly report in writing to the Owner and the Consultant all accidents of any sort arising out of or in connection with the performance of the Work, whether on or adjacent to the job site, giving full details and statement of witnesses. If death or serious injuries or damages are caused, the accident shall be promptly reported by the Contractor to the Owner and the Consultant by telephone or messenger in addition to any reporting required under the applicable safety regulations.

44. GC 9.5 MOULD

S GC 9.5.3.3 Delete subparagraph 9.5.3.3 and replace with the following:

extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor* and the *Owner*. If, in the opinion of the *Consultant*, the *Contractor* has been delayed in performing the *Work* and/or has incurred additional costs under paragraph 9.5.1.2, the *Owner* shall reimburse the *Contractor* for the reasonable costs incurred as a result of the delay and as a result of taking those steps, and

45. GC 10.1 TAXES AND DUTIES

S GC10.1.2 Amend paragraph 10.1.2 by adding the following sentence to the end of the paragraph: For greater certainty, the *Contractor* shall not be entitled to any mark-up for overhead or profit on any increase in such taxes and duties and the *Owner* shall not be entitled to any credit relating to mark-up for overhead or profit on any decrease in such taxes. The *Contractor* shall provide a detailed breakdown of additional taxes if requested by the *Owner* in a form satisfactory to the *Owner*.

S GC 10.1.3 Add new paragraph 10.1.3 as follows:

Where the *Owner* is entitled to an exemption or a recovery of sales taxes, customs duties, excise taxes or *Value Added Taxes* applicable to the *Contract*, the *Contractor* shall, at the request of the *Owner*, assist with the application for any exemption, recovery or refund of all such taxes and duties and all amounts recovered or exemptions obtained shall be for the sole benefit of the *Owner*. The *Contractor* agrees to endorse over to the *Owner* any cheques received from the federal or provincial governments, or any other taxing authority, as may be required to give effect to this paragraph.

46. GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

S GC10.2.5 Amend paragraph 10.2.5 by addition the words "Subject to GC 3.4" at the beginning of the paragraph. Add the following to the end of the second sentence:

…and no further *Work* on the affected components of the *Contract* shall proceed until these directives have been obtained by the *Contractor* from the *Consultant*.

S GC 10.2.6 Amend paragraph 10.2.6 by adding the following sentence to the end of the paragraph: In the event the *Owner* suffers loss or damage as a result of the *Contractor's* failure to

comply with paragraph 10.2.5 and notwithstanding any limitations described in paragraph 13.1.1, the *Contractor* agrees to indemnify and to hold harmless the *Owner* and the *Consultant* from and against any claims, demands, losses, costs, damages, actions suits or proceedings resulting from such failure by the *Contractor*.

S GC 10.2.8 Add new paragraph 10.2.8 as follows:

10.2.8 The *Contractor* shall furnish all certificates that are required or given by the appropriate governmental authorities as evidence that the *Work* as installed conforms with the *Applicable Law*, including certificates of compliance for the *Owner's* occupancy or partial occupancy. The certificates are to be final certificates giving complete clearance of the *Work*, in the event that such governmental authorities furnish such certificates.

47. GC 10.4 WORKERS' COMPENSATION

S GC10.4.1 Delete paragraph 10.4.1 and replace with the following:

Prior to commencing the *Work*, and with each and every application for payment thereafter, including the *Contractor's* application for payment of the holdback amount following *Substantial Performance of the Work* and again with the *Contractor's* application for final payment, the *Contractor* shall provide evidence of compliance with workers. compensation legislation in force at the *Place of the Work*, including payments due thereunder.

S GC 10.4.2 Add new paragraph 10.4.2 as follows:

At any time during the term of the *Contract*, when requested by the *Owner*, the *Contractor* shall provide such evidence of compliance by the *Contractor* and *Subcontractors*.

48. GC 11.1 INSURANCE

S GC 11 Delete entirety of GC 11 - INSURANCE and CCDC 41 and replace with the following:

GC 11.1.1 Without restricting the generality of GC 12.3 - WARRANTY, 13.1 - INDEMNIFICATION, and 13.2 . WAIVER OF CLAIMS, the Contractor shall provide, maintain, and pay for the insurance coverages specified in GC 11.1 - INSURANCE. Unless otherwise stipulated, the duration of each insurance policy shall be from the date of commencement of the Work until the expiration of the warranty periods set out in the Contract Documents. Prior to commencement of the Work and upon the placement, renewal, amendment, or extension of all or any part of the insurance, the Contractor shall promptly provide the Owner with confirmation of coverage and, if required, a certified true copy of the policies certified by an authorized representative of the insurer together with copies of any amending endorsements.

.1 General Liability Insurance

General liability insurance shall be in the name of the Contractor, with the Owner and the Consultant named as additional insureds, with limits of not less than $5,000,000.00 inclusive per occurrence for bodily injury, death, and damage to property, including loss of use thereof, for itself and each of its employees, Subcontractors and/or agents. The insurance coverage shall not be less than the insurance required by IBC Form 2100, or its equivalent replacement, provided that IBC Form 2100 shall contain the latest edition of the relevant CCDC endorsement form. To achieve the desired limit, umbrella, or excess liability insurance may be used. All liability coverage shall be maintained for completed operations hazards from the date of Substantial Performance of the Work, as set out in the Substantial Performance of the Work certificate, on an ongoing basis for a period of 6 years following Substantial Performance of the Work. Where the Contractor maintains a single, blanket policy, the addition of the Owner and the Consultant is limited to liability arising out of the Project and all operations necessary or incidental thereto. The policy shall be endorsed to provide the Owner with not less than 30 days' notice, in writing, in advance of any cancellation and of change or amendment restricting coverage.

.2 Automobile Liability Insurance

Automobile liability insurance in respect of licensed vehicles shall limits of not less than $5,000,000.00 inclusive per occurrence for bodily injury, death and damage to property, covering all licensed vehicles owned or leased by the Contractor, and endorsed to provide the Owner with not less than 30 days' notice, in writing, in advance of any cancellation, change or amendment restricting coverage. Where the policy has been issued pursuant to a government-operated automobile insurance system, the Contractor shall provide the Owner with confirmation of automobile insurance coverage for all automobiles registered in the name of the Contractor.

.3 Contractors' Equipment Insurance

"All risks" contractors' equipment insurance covering construction machinery and equipment used by the Contractor for the performance of the Work, excluding boiler insurance, shall be in a form acceptable to the Owner and shall not allow subrogation claims by the insurer against the Owner. The policies shall be endorsed to provide the Owner with not less than 30 days' notice, in writing, in advance of cancellation, change or amendment restricting coverage. Subject to satisfactory proof of financial capability by the Contractor for self-insurance of his equipment, the Owner agrees to waive the equipment insurance requirement.

.4 Other Insurance

(1) The policies shall allow for partial or total use or occupancy of the Work.

(2) The policies shall provide that, in the case of a loss or damage, payment shall be made to the Owner and the Contractor as their respective interests may appear. The Contractor shall act on behalf of the Owner for the purpose of adjusting the amount of such loss or damage payment with the insurers. When the extent of the loss or damage is determined, the Contractor shall proceed to restore the Work. Loss or damage shall not affect the rights and obligations of either party under the Contract except that the Contractor shall be entitled to such reasonable extension of the Contract Time, relative to the extent of the loss or damage, as determined by the Owner, in its sole discretion.

(3) The Contractor shall be entitled to receive from the Owner, in addition to the amount due under the Contract, the amount at which the Owner's interest in restoration of the Work has been appraised, such amount to be paid as the restoration of the Work proceeds and as provided in GC 5.2 - APPLICATIONS FOR PAYMENT and GC 5.3 - PAYMENT. In addition, the *Contractor* shall be entitled to receive from the payments made by the insurer the amount of the *Contractor's* interest in the restoration of the *Work*.

(4) In the case of loss or damage to the *Work* arising from the work of *Other Contractors*, or the *Owner's* own forces, the *Owner*, in accordance with the *Owner* shall pay the *Contractor* the cost of restoring the *Work* as the restoration of the *Work* proceeds and as provided in GC 5.2 - APPLICATIONS FOR PAYMENT and GC 5.3 - PAYMENT.

GC 11.1.2 The Contractor shall be responsible for deductible amounts under the policies except where such amounts may be excluded from the Contractor's responsibility by the terms of GC 9.1 - PROTECTION OF WORK AND PROPERTY and GC 9.2 - TOXIC AND HAZARDOUS SUBSTANCES.

GC 11.1.3 Where the full insurable value of the Work is substantially less than the Contract Price, the Owner may reduce the amount of insurance required to waive the course of construction insurance requirement.

GC 11.1.4 If the Contractor fails to provide or maintain insurance as required by the Contract Documents, then the Owner shall have the right to provide and maintain such insurance and provide evidence of same to the Contractor. The Contractor shall pay the costs thereof to the Owner on demand, or the Owner may deduct the amount that is due or may become due to the Contractor.

GC 11.1.5 All required insurance policies shall be with insurers licensed to underwrite insurance in the jurisdiction of the Place of the Work.

49. GC 11.2 CONTRACT SECURITY

S Add a new General Condition 11.2 - CONTRACT SECURITY:

GC 11.2.1 Subject to paragraph 11.2.4, the Contractor shall furnish a performance bond in favour of the Owner, covering the faithful performance of the Contract, including the payment obligations arising there under, made upon the contract bond form of the Owner and issued by such surety company(ies) as the Owner may approve. The bond shall be for one hundred per cent (100%) of the Contract Price or such other amount as may be specified in the Contract Documents.

GC 11.2.2 The Contractor shall furnish a labour and material payment bond in favour of the Owner in a form satisfactory to the Owner and issued by such surety company(ies) the Owner may approve. The bond shall be for one hundred per cent (100%) of the Contract Price.

GC 11.2.3 It is the intention of the Contract that the performance bond shall be applicable to all of the Contractor's obligations under this Contract and, wherever a performance bond is provided with language which conflicts with this intention, it shall be deemed to be amended to comply. The Contractor represents and warrants that it has provided its surety with a copy of the Contract prior to the issuance of such bonds.

GC 11.2.4 Where the Contract Price, arising from the Owner's award of the Contract, includes Subcontractor default insurance in lieu of a performance bond, the Contractor shall deliver to the Owner a certified copy of the policy of Subcontractor default insurance. Such policy shall have an aggregate loss limit of not less than 100% of the Contract Price and a claim limit of not less than 100% of such Contract Price. Such policy of insurance shall be subject to the approval of the Owner, acting reasonably, as to the terms and conditions of the Subcontractor default insurance, including those described in this paragraph 11.2.4."

50. GC 12.1 READY-FOR-TAKEOVER

S GC 12.1.1.9 Add new subparagraph 12.1.1.9 as follows:

The Contractor shall remove all waste products and debris, other than that resulting from the work of the Owner, Other Contractors or their employees, and shall leave the Place of the Work clean and suitable for use or occupancy by the Owner. The Contractor shall remove products, tools, Construction Equipment, and Temporary Work not required for the performance of the remaining work.

S GC 12.1.5 Delete paragraph 12.1.5 in its entirety and substitute the following:

Following the confirmation of the date of *Ready-for-Takeover*, the following shall apply to completing the *Work*:

(i) Contractor is to complete the *Work* within sixty (60) calendar days.

(ii) No payments will be processed between *Ready-for-Takeover* and the completion of the *Work*.

(iii) The *Owner* reserves the right to contract out any or all unfinished *Work* if it has not been completed within 60 days of *Ready-for-Takeover* without prejudice to any other right or remedy and without affecting the warranty period. The cost of completing the *Work* shall be deducted from the *Contract Price*.

S Add new paragraphs 12.1.7 and 12.1.8 as follows:

GC 12.1.7 The Contractor shall submit full and complete digital record or As-Built Drawings to the Consultant within 45 days of the confirmation of the date of Ready-for-Takeover and the Owner shall be at liberty to withhold, from amounts otherwise payable to the Contractor, an

amount not to exceed one percent of the Contract Price as security for the obligation of the Contractor to deliver such digital record or As-Built Drawings.

GC 12.1.8 Together with the submission of its written application for Ready-for-Takeover, the Contractor shall submit to the Consultant and to the Owner a statutory declaration setting forth in reasonable detail any then outstanding and unresolved disputes or claims between the Contractor and any Subcontractor or Supplier, including any claims allegedly arising from delay, which are, directly or indirectly, related to any then outstanding or anticipated disputes or claims between the Contractor and the Owner, and this disclosure shall, at a minimum:

1. identify the parties involved;

2. identify the amount in dispute;

3. provide a brief statement summarizing the position of each party;

4. include copies of any correspondence or documents in support of either party's position;

5. include copies of any documents of any court or arbitration process related to the matter;

6. identify the dispute or claim between the Contractor and the Owner to which the matter relates; and

7. include a copy of any written agreement or a summary of any oral agreement between the parties related to resolution of the matter.

The disclosure requirements detailed herein are of a continuing nature and survive completion of the *Work*. Accordingly, the *Contractor* shall supplement the information provided with the original statutory declaration with additional materials pertaining to new or existing disputes or claims, as they become available. The *Contractor* shall not be entitled to recover from the *Owner* any amount pertaining to any claim or dispute referred to in this paragraph, if the provisions of this paragraph have not been fully complied with. For greater certainty, the *Contractor* is not obliged to make the aforementioned disclosure with respect to any dispute or claim that is not related to or does not touch upon any then outstanding and unresolved dispute or claim between the *Contractor* and the *Owner*.

51. GC 12.2 EARLY OCCUPANCE BY THE OWNER

S GC 12.2.4 Delete paragraph 12.2.4 in its entirety.

52. GC 12.3 WARRANTY

S GC 12.3.2 Delete from the first line of paragraph 12.3.2 the word, "The" and substitute the words "Subject to paragraph 3.4.1, the."

S GC 12.3.4 Add the following sentence to paragraph 12.3.4: "Defects and deficiencies shall include, without limitation, shrinkage, expansion and movement."

S Add new paragraphs 12.3.7 to 12.3.12 as follows:

GC 12.3.7 Where required by the Contract Documents, the Contractor shall provide a maintenance bond as security for the performance of the Contractor's obligations as set out in GC 12.3 - WARRANTY.

GC 12.3.8 The Contractor shall provide fully and properly completed and signed copies of all warranties and guarantees required by the Contract Documents, containing:

1. the proper name of the Owner;

2. the proper name and address of the Project;

3. the date the warranty commences, which shall be at the .date of Substantial Performance of the Work. unless otherwise agreed upon by the Consultant in writing.

4. a clear definition of what is being warranted and/or guaranteed as required by the Contract Documents; and

5. the signature and seal (if required by the governing law of the Contract) of the company issuing the warranty, countersigned by the Contractor.

GC 12.3.9 Should any Work be repaired or replaced during the time period for which it is covered by the specified warranty, a new warranty shall be provided under the same conditions and for the same period as specified herein before. The new warranty shall commence at the completion of the repair or replacement.

GC 12.3.10 The Contractor shall ensure that its Subcontractors are bound to the requirements of GC 12.3 - WARRANTY for the Subcontractor's portion of the Work.

GC 12.3.11 The Contractor shall ensure that all warranties, guarantees or other obligations for Work, services or Products performed or supplied by any Subcontractor, Supplier or other person in connection with the Work are obtained and available for the direct benefit of the Owner. In the alternative, the Contractor shall assign to the Owner all warranties, guarantees or other obligations for Work, services or Products performed or supplied by any Subcontractor, Supplier or other person in connection with the Work and such assignment shall be with the consent of the assigning party, where required by Applicable Law, or by the terms of that party's contract. Such assignment shall be in addition to, and shall in no way limit, the warranty rights of the Owner under the Contract Documents.

GC 12.3.12 The Contractor shall commence or correct any deficiency within 2 Working Days after receiving a notice from the Owner or the Consultant, and shall complete the Work as expeditiously as possible, except in the case where the deficiency prevents maintaining security or where basic systems essential to the ongoing business of the Owner and/or its tenants cannot be maintained operational as designed. In those circumstances all necessary corrections and/or installations of temporary replacements shall be carried out immediately as an emergency service. Should the Contractor fail to provide this emergency service within 8 hours of a request being made during the normal business hours of the Contractor, the Owner is authorized, notwithstanding GC 3.1, to carry out all necessary repairs or replacements at the Contractor's expense.

53. GC 13.1 INDEMNIFICATION AND WAIVER

S Delete GC 13.1 . INDEMNIFICATION in its entirety and substitute as follows:

GC 13.1.1 The Contractor shall indemnify and hold harmless the Owner, its parent, subsidiaries and affiliates, the Consultant and their respective partners, trustees, officers, directors, agents and employees from and against any and all claims, liabilities, expenses, demands, losses, damages, actions, costs, suits, or proceedings (hereinafter called .claims.), whether in respect of claims suffered by the Owner or in respect of claims by third parties, that directly or indirectly arise out of, or are attributable to, the acts or omissions of the Contractor, its employees, agents, Subcontractors, Suppliers or any other persons for whom it is in law responsible (including, without limitation, claims that directly or indirectly arise out of, or are attributable to, loss of use or damage to the Work, the Owner's property or equipment, the Contractor's property or equipment or equipment or property adjacent to the Place of the Work or death or injury to the Contractor's personnel).

GC 13.1.2 The provisions of GC 13.1 - INDEMNIFICATION shall survive the termination of the Contract, howsoever caused and no payment or partial payment, no issuance of a final certificate of payment and no occupancy in whole or in part of the Work shall constitute a waiver or release of any of the provisions of GC 13.1.

54. GC 13.2 WAIVER OF CLAIMS

S GC 13.2.1 In the third line, add the words .claims for delay pursuant to GC . 6.5 DELAYS. after the word .limitation.. Add the words .(collectively .Claims.). after .*Ready-for-Takeover* date. in the sixth line.

S GC 13.2.1.1 Change the word “claims” to “Claims” and change the word “claim” to “Claim.”

S GC 13.2.1.2 Delete paragraph in its entirety.

S GC 13.2.1.4 Change the word “claims” to “Claims.”

S GC 13.2.2 Change the words “in paragraphs 13.2.1.2 and 13.2.1.3” to “in paragraph 13.2.1.3.” Change the word “claims” to “Claims” in both instances and change the word “claim” to “Claim.” Delete the reference to "395 calendar days" in the last line of paragraph 13.2.2 and substitute "120 calendar days".

S GC 13.2.3 Delete paragraph in its entirety.

S GC 13.2.4 Delete paragraph in its entirety.

S GC 13.2.5 Delete paragraph in its entirety.

S GC 13.2.6 Change the word “claim” to ‘Claim” in all instances in the paragraph.

S GC 13.2.8 Change “The party” to “The Contractor”. Change the word “claim” to “Claim” in all instances in the paragraph.

S GC 13.2.9 Change “under paragraphs 13.2.1 or 13.2.3. to .under paragraph 13.2.1.” Change both instances of the words “the party” to “the Contractor.” Change the word “claim” to “Claim” in all instances in the paragraph.

55. GC 14 OTHER PROVISIONS

S Add new General Condition 14 - OTHER PROVISIONS as follows:

56. GC 14.1 OWNERSHIP OF MATERIALS

GC 14.1.1 Unless otherwise specified, all materials existing at the Place of the Work at the time of execution of the Contract shall remain the property of the Owner. All Work and Products delivered to the Place of the Work by the Contractor shall be the property of the Owner. The Contractor shall remove all surplus or rejected materials as its property when notified in writing to do so by the Consultant.

57. GC 14.2 CONSTRUCTION LIENS

GC 14.2.1 In the event that a claim for lien is registered against the Project by a Subcontractor, Sub subcontractor or Supplier, and provided the Owner has paid all amounts properly owing under the Contract, the Contractor shall, at its own expense:

.1 within 10 calendar days, ensure that any and all claims for lien and certificates of action are discharged, released, or vacated by the posting of security or otherwise; and

.2 in the case of written notices of lien, ensure that such notices are withdrawn, in writing.

GC 14.2.2 In the event that the Contractor fails to conform with the requirements of paragraph 14.2.1, the Owner may fulfil those requirements without Notice in Writing to the Contractor and set off and deduct from any amount owing to the Contractor, all costs and associated expenses, including the costs of posting security and all legal fees and disbursements associated with

discharging or vacating the claim for lien or certificate of action and defending the action. If there is no amount owing by the Owner to the Contractor, then the Contractor shall reimburse the Owner for all of the said costs and associated expenses.

GC 14.2.3 Notwithstanding any other provision in the Contract, the Consultant shall not be obligated to issue a certificate and the Owner shall not be obligated to make payment to the Contractor if, at the time such certificate or payment was otherwise due:

.1 a claim for lien has been registered against the *Project* lands;

.2 if the *Owner* or mortgagee of the *Project* lands has received written notice of a lien; or

.3 the *Owner* or *Consultant* reasonably believe that any party has purported to retain title to *Products* or materials in respect of which an application for payment has been made.

GC 14.2.4 Without limiting the foregoing, the Contractor shall, if requested by the Owner, defend, indemnify and save the Owner harmless from the amount of all such claims and the costs of defending any and all actions commenced against the Owner pursuant to the construction/builder's lien legislation in force at the Place of the Work, including the legal costs of the Owner, unless the lien was a direct result of a breach of the Contract by the Owner or the non-payment by the Owner of a valid charge or claim under the Contract.
GC 14.2.5 GC 14.2 - CONSTRUCTION LIENS does not apply to construction/builder's liens claimed by the Contractor.

58. GC 14.3 CONTRACTOR DISCHARGE OF LIABILITIES

14.3.1 In addition to the obligations assumed by the Contractor pursuant to GC 3.6 - SUBCONTRACTORS AND SUPPLIERS, the Contractor agrees to discharge all liabilities incurred by it for labour, materials, services, Subcontractors and Products, used or reasonably required for use in the performance of the Work, except for amounts withheld by reason of legitimate dispute which have been identified to the party or parties, from whom payment has been withheld.

59. GC 14.4 RECORDS/DAILY REPORTS/DAILY LOGS

GC 14.4.1 The Contractor shall maintain and keep accurate Project records (which means all tangible records, documents, computer printouts, electronic information, books, plans, Drawings, Specifications, accounts or other information relating to the Work) in its office in Ontario in accordance with requirements of Applicable Law, but in any event for not less than 6 years from Substantial Performance of the Work or until all claims have been settled. During this time, the Contractor shall allow the Owner access to the Project records during normal business hours upon the giving of reasonable notice. The Contractor shall ensure that equivalent provisions to those provided herein are made in each subcontract and shall require the Subcontractors and Suppliers to incorporate them into every level of contract thereunder for any part of the Work.

60. GC 14.5 CONTINGENT LIABILITY

GC 14.5.1 The parties expressly agree that notwithstanding any other provision of this Agreement, the remedies, recourse and rights of the Contractor or any third party shall be limited to the Owner, and the Contractor unconditionally and irrevocably waives and releases all other claims, remedies, recourse or rights against the Crown in right of Ontario in respect of the Agreement, and that it shall have no remedies, recourse or rights in respect of the Agreement against the Crown in right of Ontario, any Ministry, Minister, agent, agency, servant, employee or representative of the Crown or any director, officer, servant, agent, employee or representative of a Crown agency or a corporation in which the Crown holds a majority of the shares or appoints a majority of the directors or member, other than against the Owner and the Owner's assets.

61. GC 14.6 DOCUMENT REVIEW

GC 14.6.1 The Contractor shall review the Contract Documents and shall report promptly to the Consultant any error, inconsistency, or omission the Contractor may discover. Such review by the Contractor shall be undertaken with the standard of care described in paragraph 3.11.1 of the Contract. Except for its obligation to make such review and report the result, the Contractor does not assume any responsibility to the Owner or to the Consultant for the accuracy of the Contract Documents. Provided it has exercised the degree of care and skill described in this paragraph 14.6.1, the Contractor shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the Contract Documents, which the Contractor could not reasonably have discovered through the exercise of the required standard of care.

GC 14.6.2 If, at any time, the Contractor finds errors, inconsistencies, or omissions in the Contract Documents or has any doubt as to the meaning or intent of any part thereof, including laying out of the Work, the Contractor shall immediately notify the Consultant, and request instructions, a Supplemental Instruction, Change Order, or Change Directive, as the case may require, and the Contractor shall not proceed with the work affected until the Contractor has received such instructions, a Supplemental Instruction, Change Order or Change Directive. Neither the Owner nor the Consultant will be responsible for the consequences of any action of the Contractor based on oral instructions.

GC 14.6.3 Errors, inconsistencies and/or omissions in the Drawings and/or Specifications which do not allow completion of the Work of the Contract shall be brought to the Consultant's attention prior to the execution of the Contract by means of an RFI.

GC 14.6.4 Notwithstanding the foregoing, errors, inconsistencies, discrepancies and/or omissions shall not include lack of reference on the Drawings or in the Specifications to labour and/or Products that are required or normally recognized within respective trade practices as being necessary for the complete execution of the Work. The Contactor shall not use subsequent RFIs, issued during execution of the Work to establish a change and/or changes in the Work pursuant to Part 6 - CHANGES IN THE WORK.

62. GC 14.7 DOCUMENTS AT THE SITE

63.

GC 14.7.1 The Contractor shall keep one copy of the current Contract Documents, Supplemental Instructions, contemplated Change Orders, Change Orders, Change Directives, cash allowance disbursement authorizations, reviewed Shop Drawings, submittals, reports and records of meeting at the Place of the Work, or available to the Owner electronically in good order and available to the Owner and Consultant.

END OF SECTION 00800

1.1. DOCUMENTS REQUIRED

1. Maintain at job site, one copy each of the following:
    1. Contract drawings.
    2. Specification.
    3. Addenda.
    4. Reviewed shop drawings.
    5. Change orders.
    6. Other modifications to Contract.
    7. Field test reports.
    8. Copy of approved work schedule.
    9. Manufacturers installation and application instructions.
    10. Standards listed in Part 1 of Specification Sections under Reference Standards.

1.2. PRODUCTS SUPPLIED BY CONSULTANT

1. Promptly inspect delivered products and give written report to Consultant on condition of all items received.
2. Install, connect and finish products specified.

1.3. WORK SCHEDULE

1. In accordance with schedule and in form acceptable to Consultant, provide within five working days after Contract award, schedule showing dates for:
    1. Submission of shop drawings, material lists and samples.
    2. Delivery of all equipment and materials.

1.4. COST BREAKDOWN

1. Before submission of first progress claim submit breakdown of contract price in detail as directed by Consultant and aggregating contract price. After approval by Consultant cost breakdown will be used as basis for progress payment.

1.5. CONTRACTOR'S USE OF SITE

1. Contractor shall use access to building as indicated by the Owners.

2. Storage areas are to be identified by the Owner during construction period.

3. Do not unreasonably encumber site with materials or equipment.

4. Move stored products or equipment which interfere with operations of Consultant or other contractors.

5. Obtain and pay for use of additional storage or work areas needed for operations.

1.6. CODES AND STANDARDS

1. Perform work in accordance with the latest additions of the Ontario Building Code 2012 and any other code of provincial of local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

2. Meet or exceed requirements of contract documents, codes and referenced documents.

1.7. PROJECT MEETINGS

1. Consultants will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

1.8. LOCATION OF EQUIPMENT AND FIXTURES

1. Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

2. Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

3. Inform consultant of impending installation and obtain his approval for actual location.

4. Submit field drawings to indicate relative position of various services and equipment when required by Consultant.

1.9. CONCEALMENT

1. Conceal conduit, and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.10. CUTTING, FITTING, AND PATCHING

1. Execute cutting, fitting and patching required to make work fit properly.

2. Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.

3. Obtain Consultant's approval before cutting, boring and sleeving load bearing members.

4. Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

1.11. EXISTING SERVICES

1. Where work involves breaking into or connecting to existing services, carry out work at times directed by Owners with minimum of disturbance to occupants.

2. Before commencing work, establish location and extent of service lines in area of work and notify Consultant of findings.

3. Submit schedule to and obtain approval from Consultant for any shut down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.

4. Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.

5. Remove all abandoned piping and heating equipment. Selected equipment will be owner’s property.

6. Record locations of maintained, re-routed fire alarm wiring.

1.12. ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

1. Execute Work with least possible interference or disturbance to occupants, public and normal use of premises. Arrange with Consultant to facilitate execution of work.

1.13. ADDITIONAL DRAWINGS

1. Consultant may furnish additional drawings to assist proper execution of work. These drawings will be listed, “Issued for clarification only”. Such drawings shall have same meaning and intent as if they were included with plans referred to in contract documents.

1.14. BUILDING PERMIT

1. Apply for building permit at local Building Department. Include all costs in tender price. Consultant will provide two sets of contract documents at no charge.

1.15. BUILDING SMOKING ENVIRONMENT

1. Comply with smoking restrictions.

END OF SECTION 01005

1.1. REQUIREMENTS INCLUDED

1. Shop drawings and product data.
2. Samples.
3. Operating and maintenance manuals.
4. Record drawings.
5. Certificates of transcripts.

1.2. ADMINISTRATIVE

1. Submit to Consultant submittals listed for review. Submit with reasonable promptness and in an orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
2. Work affected by the submittal shall not proceed until review is complete.
3. Review submittals prior to submission to the Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of the Work and the Contract Documents. Submittals not stamped, signed, dated and identified as the specified project will be returned without being examined and shall be considered rejected.
4. Verify field measurements and affected adjacent Work are coordinated.
5. Contractor's responsibility for errors and omissions in submission is not relieved by Consultant review of submittals.
6. Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
7. Keep one reviewed copy of each submission on site.

1.3. SHOP DRAWINGS AND PRODUCT DATA

1. Refer to GC 3.8.
2. The term "Shop Drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate details of a portion of the Work.
3. Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work.

Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the Section under which the adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

4. Adjustments made on shop drawings by the Consultant are not intended to change the Contract Price. If adjustments affect the value or Work, state such in writing to the Consultant prior to proceeding with the Work.

5. Make changes in shop drawings as the Consultant may require, consistent with Contract Documents. When resubmitting, notify the Consultant in writing of any revisions other than those requested.

6. Submit photocopies of shop drawings for each requirement requested in Specification Sections and as the Consultant may reasonably request.

7. Submit 6 photocopies of product data sheets or brochures for requirements requested in specification Sections and as the Consultant may reasonably request where shop drawings will not be prepared due to standardized manufacture of product.

8. If upon review by the Consultant, no errors or omissions are discovered or if only minor corrections are made, 4 copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through the same procedure indicated above, shall be performed before fabrication and installation of Work may proceed.

1.4. OPERATING MAINTENANCE MANUALS

1. Two weeks prior to Substantial Performance of the Work, submit to the Consultant Operating and Maintenance Manuals which must be electronic and three (3) hard copies.

2. Manuals to contain operational information on equipment, cleaning schedules, and similar maintenance information. Instructions in this manual shall be in simple language so as to guide the Owner in the proper operation and maintenance of building components.

3. Bind contents in a three-ring, hard covered, plastic jacketed binder. Organize contents into applicable categories of work, parallel to specification Sections.

4. In addition to information specified, include the following:

    1. Title sheet, labelled "Operating and Maintenance Instructions", containing project name and date.

    2. List of names, addresses and phone numbers of subcontractors and suppliers who can affect repair or maintenance on equipment.

    3. List of contents.

    4. Final shop drawings and product data of equipment.

5. Record drawings of electrical installation.

6. Full description of building systems and operation.

1.5. RECORD DRAWINGS

1. After award of Contract, the Consultant will provide one (1) set of white prints for the purpose of maintaining record drawings. Accurately, neatly record deviations from Contract Documents caused by site conditions and changes ordered by the Consultants. Make changes in red ink.

2. Record locations of concealed components of mechanical and electrical services.

3. Identify drawings as "Project Record Copy". Maintain in new condition and make available for inspection on site by Consultant.

4. On completion of Work and prior to final inspection, submit two copies of record documents to Consultant.

1.6. CERTIFICATE AND TRANSCRIPTS

1. After award of Contract, submit WSIB status transcription of insurance.

END OF SECTION 01300

1.1. REQUIREMENTS INCLUDED

1. Inspection and testing, administrative and enforcement requirements.

2. Tests.

1.2. RELATED REQUIREMENTS

1. Section 01300: Submission of shop drawings to confirm product quality.

1.3. INSPECTION

1. Refer to GC 2.3.

2. The Owner and the Consultant shall have access to the Work.

3. Give timely notice requesting inspection if work is designated for special tests, inspections or approvals by Consultant instructions, or the law of the Place of the Work.

4. If the Contractor covers or permits to be covered work that has been designated for special tests, inspections or approvals before such is made, uncover such work, have the inspections or tests satisfactorily completed and make good such work.

5. The Consultant may offer any part of the work to be examined if such work is suspected to be not in accordance with the Contract Documents, correct such work and pay the cost of examination and correction. If such work is found in accordance with the Contract Documents, the Owner will pay the cost of examination and replacement.

1.4. PROCEDURES

1. Notify the appropriate agency and Consultant in advance of the requirements for tests, in order that attendance arrangements can be made.

2. Submit samples, and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the work.

3. Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5. REJECTED WORK

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

2. Make good other Contractors work damaged by such removals or replacements promptly.

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

1.6. REPORTS

1. Submit final test report confirming operation and system function.

END OF SECTION 01400

1.1. CONSTRUCTION SAFETY MEASURES

1. Observe and enforce construction on safety measures required by Ontario Building Code 2024, Provincial Government, WSIB, and Municipal Statutes and authorities.

2. In event of conflict between any provisions of above authorities the most stringent provision governs.

1.2. FIRE SAFETY REQUIREMENTS

1. Comply with requirements of Ontario Fire Marshal's Office.

2. All Contractor superintendents shall be briefed by the Owner on Facility’s fire safety program.

END OF SECTION 01545

1.1. REQUIREMENTS INCLUDED

1. Reference standards.
2. Product quality, availability, storage, handling, protection, transportation.
3. Manufacturer's instructions.
4. Workmanship, co-ordination, cutting, fastenings.
5. Existing facilities.

1.2. REFERENCE STANDARDS

1. Within the text of the specifications reference may be made to the following standards:
    1. ANSI - American National Standards Institute
    2. ASTM - American Society of Testing and Materials
    3. OESC - Ontario Electrical Safety Code
    4. CEMA - Canadian Electrical Manufacturers Association
    5. CGSB - Canadian General Standards Board
    6. CPCA - Canadian Painting Contractors Association
    7. CSA - Canadian Standards Association
    8. IEEE - Institute of Electrical and Electronic Engineers
    9. IPCEA - Insulated Power Cable Engineers Association
    10. OBC - Ontario Building Code 2012
    11. ULC - Underwriters Laboratories of Canada.
2. Conform to these standards, in whole or in part, as specifically requested in the specifications.
3. If there are question as to whether any product or system is in conformance with applicable standards, the Consultants reserves the right to have such products or systems tested to prove or disprove conformance.
4. Conform to latest date of issue of reference standards effect on date of submission of bids except where a specific date or issue is specifically noted.

1.3. PRODUCTS AND MATERIALS

1. Quality:

    1. Products, materials, equipment and articles (referred to as Products throughout the specifications) incorporated in the Work shall be new, not damaged or defective, and of the best quality (compatible with specifications) for the purpose intended. If required, furnish evidence as to type, source and quality of Products provided.

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

    3. Should any dispute arise as to the quality of fitness of products, the decision rests strictly with the Consultant based upon the requirements of the Contract Documents.

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

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

2. Transportation

    1. Pay costs of transportation of Products required in the performance of Work.

1.4. MANUFACTURER'S INSTRUCTIONS

1. Unless otherwise indicated in the specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

2. Notify the consultant in writing of conflicts between the specifications and manufacturers instructions, so that the Consultant may establish the course of action.

3. Improper installation or erection of Products, due to failure in complying with these requirements, authorizes the Consultant to require removal and re-installation at no increase in Contract Price.

1.5. WORKMANSHIP

1. General

    1. Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required work is such as to make it impractical to produce required

results.

2. Do not employ any unfit person or anyone unskilled in their required duties. The Consultant reserves the right to require the dismissal from the site, workers deemed incompetent, careless, insubordinate or otherwise objectionable.

3. Decisions as to the quality of fitness of workmanship in cases of dispute rest solely with the Consultant whose decision is final.

2. Location of Fixtures and Devices

1. Consider the location of fixtures, outlets and devices indicated as approximate.

2. Inform the Consultant of a conflicting installation. Install as directed.

3. Fastenings

1. Provide metal fastenings and accessories in same textures, colour and finish as adjacent materials, unless indicated otherwise.

2. Prevent electrolytic action between dissimilar metals and materials.

3. Use noncorrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in the affected specification Section.

4. Protection of Work in Progress.

1. Adequately protect Work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by the Consultant Price.

5. Existing Utilities

1. When breaking into or connecting to existing services or utilities, execute work at times directed by owner with a minimum of disturbance of work, and/or building occupants.

2. Protect, relocate and maintain existing active services. When inactive services are encountered, cap off in a manner approved by authority having jurisdiction and stake or otherwise record location of capped service.

END OF SECTION 01600

1.1. REQUIREMENTS INCLUDED

1. Final cleaning.
2. Systems demonstration.
3. Document submission.
4. Project commissioning.
5. Inspection and takeover procedures.

1.2. RELATED REQUIREMENTS

1. Section 01300: Submission of record drawings.
2. Section 01300: Operating/maintenance manuals.
3. General Conditions of the Contract: Fiscal provisions, legal submittal and other administrative requirements.

1.3. FINAL CLEANING

1. Refer to GC 3.13.
2. When the Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for the performance of the remaining Work.
3. Remove waste products and debris other than that caused by the Owner, other contractors or their employees, and leave the Work clean and suitable for occupancy by Owner.
4. When the Work is Totally Performed, remove surplus products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the Owner or other Contractors.
5. Remove waste materials and debris from the site at regularly scheduled times or dispose of as directed by the Consultant. Do not burn waste materials on site.
6. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
7. Remove stains, spots, marks and dirt from mechanical equipment and electrical panels.
8. Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
9. Clean equipment to a sanitary condition.

1.4. SYSTEMS DEMONSTRATION

1. Prior to final inspection, demonstrate operation of each system to Owner and Consultant.

2. Instruct personnel in operation, adjustment, and maintenance of equipment and systems, using provided operation and maintenance data as the basis for instruction.

1.5. DOCUMENTS

1. Collect reviewed submittals (Section 01300) and assemble documents executed by Subcontractors, suppliers, and manufacturers.

2. Submit material prior to final Application for Payment. For equipment put into use with Owner's permission during construction, submit within 10 days after start-up. For items of Work delayed materially beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

3. Provide warranties fully executed and notarized – min. 1 year.

4. Execute transition of Performance and Labour and Materials Payment Bond to warranty period requirements.

5. Submit final statement of accounting giving total adjusted Contract Sum, previous payments, and monies remaining due.

6. Consultant will issue a final change order reflecting approved adjustments to Contract Sum not previously made.

1.6. PROJECT COMMISSIONING

1. Expedite and complete deficiencies and defects identified by the Consultant.

2. Review maintenance manual contents, operating and maintenance instructions, record "as-built" drawings, spare parts, materials for completeness.

3. Submit required documentation such as statutory declarations, Worker's Compensation Certificates, warranties, certificates of approval or acceptance from regulating bodies.

4. Review inspection and testing reports to verify conformance to the intent of the documents and that changes, repairs or replacements have been completed.

5. Co-ordinate Owner's mocking-in of staff, furnishings, equipment with building accessibility, and contractor's and subcontractor's cleaning-up and completion activities all to suit Owner's work schedule and not disrupt Owner's productivity.

6. Provide on-going review, inspection and attendance to building call-back, maintenance and repair problems during Warranty periods.

1.7. INSPECTION/TAKEOVER PROCEDURES

1. Prior to application for certificate of Substantial Performance, carefully inspect the Work and ensure it is complete, that major and minor construction deficiencies are complete and/or corrected and the building is clean and in condition for occupancy. Notify the Consultant in writing, of satisfactory completion of the Work and request an inspection.

2. During the Consultant inspection, a list of deficiencies and defects will be tabulated. Correct same.

3. When the Consultant considers deficiencies and defects have been corrected and it appears requirements of the Contract have been performed, make application for certificate of Substantial Performance. Refer to General Conditions Article GC 5.4 for specifics to application.

END OF SECTION 01700

PART 1– GENERAL

1.1. GENERAL

1. Division 01, General Requirements is part of this Section and shall apply as if repeated here.

1.2. REFERENCES

1. ASME B16.5-2013, Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and other Special Alloys.
2. ASME B16.18-2012, Cast Copper Alloy Solder Joint Pressure Fittings.
3. ASME B16.20-2012, Ring-Joint Gaskets and Grooves for Steel Pipe Flanges.
4. ASME B16.21-2011, Non-metallic Flat Gaskets for Pipe Flanges.
5. ASME B16.22-2013, Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
6. ASME B18.2.1-2012, Square and Hex Bolts and Screws.
7. ASTM A47M/47M-99(2004), Specification for Ferritic Malleable Iron Castings.
8. ASTM A53/A53M-12, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.
9. ASTM B32-08, Specification for Solder Metal.
10. ASTM B75/B75M-11, Specification for Seamless Copper Tube Metric.
11. CSA B149.1-10, Natural Gas Installation Code.
12. CSA W47.1-09, Certification of Companies for Fusion Welding of Steel Structures.

1.3. PRODUCT DATA

1. Submit product data in accordance with Section 01 33 00 - Submittals.

1.4. MAINTENANCE DATA

1. Provide maintenance data for incorporation into manual specified in Section 01 33 00 - Submittals.

PART 2 - PRODUCTS

2.1. PIPE

1. Steel pipe: to ASTM A120 ASTM A53, Schedule 40, seamless as follows:
    1. NPS 1/2 to 2, screwed.
    2. NPS 2 1/2 and over, plain end.
2. Copper tube: to ASTM B75M.
3. Underground - approved plastic line.

2.2. JOINTING MATERIAL

1. Screwed fittings: pulverized lead paste.
2. Welded fittings: to CSA W47.1.
3. Flange gaskets: to ANSI B16.21 or ANSI B16.20.
4. Soldered: to ASTM B32, tin antimony 95:5.

2.3. FITTINGS

1. Steel pipe fittings, screwed, flanged or welded:
    1. Malleable iron: screwed, banded, Class 150.
    2. Steel pipe flanges and flanged fittings: to ANSI B16.5.
    3. Steel butt-welding fittings.
    4. Unions: malleable iron, brass to iron, ground seat, to ASTM A47M.
    5. Bolts and nuts: to ANSI B18.2.1.
    6. Nipples: Schedule 40, to ASTM A53.
2. Copper pipe fittings, screwed, flanged or soldered:
    1. Cast copper fittings: to ANSI B16.18.
    2. Wrought copper fittings: to ANSI B16.22.

2.4. VALVES

1. Provincial Code approved, lubricated plug ball type.

PART 3– EXECUTION

3.1. PIPING

1. Install in accordance with applicable Provincial/Territorial Codes.

2. Install in accordance with CAN1-B149.1 CAN1-B149.2.

3. Assemble piping using fittings manufactured to ANSI standards.

4. Connect to equipment in accordance with manufacturer's instruction unless otherwise indicated.

5. Slope piping down in direction of flow to low points.

6. Install drip points:

    1. At all low points in piping system.

    2. At each connection to equipment.

7. Use eccentric reducers at pipe size change installed to provide positive drainage.

8. Provide clearance for access and for maintenance.

9. Ream pipes, clean scale and dirt, inside and out.

10. Install piping to minimize pipe dismantling for equipment removal.

11. Paint all gas piping yellow unless otherwise directed.

3.2. VALVES

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

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

3.3. TESTING

1. Test system in accordance with CAN1-B149.1 CAN1-B149.2.

3.4. PURGING

1. Purge after pressure test in accordance with CAN1-B149.1 CAN1-B149.2.

END OF SECTION 23 11 23

PART 1 - GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

2. This Section covers items common to Sections of Division 26. This Section supplements requirements of Division 1.

3. Coordinate all requirements with general contractor.

1.2. SCOPE OF WORK

1. The scope of work for this project includes:

    1. Provision of new, 400kW, 600V, outdoor, NG, stand by generator.

    2. Provision of new 600A, automatic transfer switch with dual bypass.

    3. Provision of outdoor-rated, camlock connection cabinet for load bank testing and portable genset tie-in.

    4. Removals/revisions to existing motor control centre (MCC).

    5. Provision of new emergency side breaker in existing MCC.

    6. Provision of new 100A, 600V distribution panel, disconnect, 45kVA, dry-type transformer and 225A, 120/208V panel board.

    7. Provision of new gas line for generator.

    8. All earthworks, concrete pad and fencing for new generator.

    9. All associated power and bonding, controls and communication cabling requirements. Refer to drawings.

    10. All removals of existing indoor, diesel generator and tank, including all piping and ductwork. Remediation of all existing wall openings.

    11. All relocations of existing equipment to accommodate new equipment.

    12. New Enbridge gas service to be by cash allowance. Contractor to coordinate.

1.3. CODES AND STANDARDS

1. In this document, all references to Code numbers shall mean “Latest Edition”.

2. Do complete installation in accordance with Ontario Electrical Safety Code.

3. Do complete installation in accordance with CSA C22.1-12 except where specified otherwise.

4. Comply with all CSA and inspection Authority Bulletins in force at time of Tender.

5. Do underground systems in accordance with CSA C22.3 No.1-10 except where specified otherwise.

6. Abbreviations for electrical terms: to CSA Z85-1983.

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

1.4. DEFINITIONS

1. “Provide” means supply and install.

2. “Approved” means approved in writing by Consultant.

3. “Inspection Authority” means Electrical Safety Authority.

4. “Consultant” means designated qualified professional engineer acting as representative of Owner for monitoring of work.

5. “Manual” means Operations and Maintenance manual.

6. “OESC” means latest edition of Ontario Electrical Safety Code

1.5. CARE, OPERATION, START-UP AND INSTRUCTION TO OWNERS

1. Provide certified personnel to instruct Owner of operation electrical equipment. Provide maintenance specialist personnel to instruct on maintenance and adjustment of electrical equipment and any changes or modification equipment must be under terms of guarantee.

2. Provide instruction during regular work hours prior to acceptance and turn over to Owner's staff for regular operation.

3. Provide these services for such period, and for as many visits as necessary to put equipment in operation and ensure that operating personnel are conversant with all aspects of its care and operation.

4. Use operation and maintenance data manual for instruction purposes. On completion of instruction, turn three manuals over to the Owner.

5. Operation and maintenance manual to be approved by and final copies deposited with consultant before final inspection.

1.6. AS-BUILT DRAWINGS

1. Site records:

1. One set to be kept on site and all changes to be recorded on daily basis. At the completion of the project, all changes shall be transferred to clean set, signed and passed to the Consultant.

2. Make these drawings available for reference purposes and to inspection at all times.

2. As-built drawings must be delivered before system acceptance.

1.7. PERMITS, FEES AND INSPECTION

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

2. Consultant will provide drawings and specifications required by Inspection at no cost.

3. Submit to the Building Department the necessary number of drawings and specifications for examination prior to commencement of work to obtain a building permit. The Contractor shall obtain and pay for the building permit. Include all costs in the tender price.

4. Submit Notice of Project to Ministry of Labour.

5. Pay associated fees and obtain all permits required for the performance of the work.

6. Notify Consultant of changes required by Inspection Authority or Building Department prior to making changes.

7. Furnish Certificates of Acceptance from Inspection Authority on completion of work to consultant.

1.8. MATERIALS AND EQUIPMENT

1. Provide materials and equipment in accordance with Division 1.

2. Equipment and material to be CSA certified. Where there is no alternative to supplying equipment which is not CSA certified, obtain special approval from Inspection Authority.

3. Factory assemble control panels and component assemblies.

1.9. EQUIPMENT IDENTIFICATION

1. Identify electrical equipment with nameplates and labels as follows:

2. Nameplates:

1. Lamacoid 3 mm (1/8") thick plastic engraving sheet, white face, black core, mechanically attached with self tapping screws. For emergency power circuits, use a red face and black core.

NAMEPLATE SIZES

Size 1	10 x 50 mm (3/8 x 2")	1 line	3 mm (1/8") high letters
Size 2	12 x 70 mm (1/2 x 3")	1 line	5 mm (1/4") high letters
Size 3	12 x 70 mm (1/2 x 3")	2 lines	3 mm (1/8") high letters
Size 4	20 x 90 mm (3/4 x 4")	1 line	8 mm (3/8") high letters
Size 5	20 x 90 mm (3/4 x 4")	2 lines	5 mm (1/4") high letters
Size 6	25 x 100 mm (1" x 4")	1 line	12 mm (1/2") high letters
Size 7	25 x 100 mm (1" x 4")	2 lines	6 mm (1/4") high letters

3. Labels:

    1. Embossed plastic labels with 6 mm (1/4") high letters unless specified otherwise.

4. Wording on nameplates and labels to be approved by Consultant prior to manufacture.

5. Allow for average of twenty-five (25) letters per nameplate and label.

6. Identification to be English.

7. Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.

8. Disconnects, starters and contactors: indicate equipment being controlled and voltage.

9. Terminal cabinets and pull boxes: indicate system and voltage.

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

11. Coordinate names of equipment and systems with Division 23 to ensure that identical names are used.

1.10. WIRING IDENTIFICATION

1. Identify wiring with permanent indelible identifying markings, 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.

3. Colour code: to CSA C22.1.

4. Use colour coded wires in communication cables, matched throughout system.

1.11. CONDUIT AND CABLE IDENTIFICATION

1. Colour code conduits, boxes and metallic sheathed cables.

2. Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.

3. Colours: 25 mm (1") wide prime colour and 20 mm (3/4") wide auxiliary colour.

	PRIME	AUXILIARY
up to 250 V	yellow	
up to 600 V	yellow	green
up to 5 kV	yellow	blue
up to 15 kV	yellow	red
Telephone	green	
Other communication systems	green	blue
Fire alarm	red	
Emergency Voice	red	blue
Other security systems	red	yellow

1.12. WIRING TERMINATIONS

1. Lugs, terminals, screws used for termination of wiring to be suitable for either copper or aluminum conductors.

1.13. MANUFACTURERS AND CSA 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 approved labels. Leave openings through insulation for viewing the plates. Contractors or sub-contractors nameplate not acceptable.

1.14. WARNING SIGNS

1. As specified and to meet requirements of Inspection Authority and Consultant.

1.15. MOUNTING HEIGHTS

1. Mounting height of equipment is from finished floor to centreline of equipment unless specified or indicated otherwise.

2. If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

3. Install electrical equipment at following heights unless indicated otherwise.

    1. Panelboards to top of trim: 1800 mm (72")

    2. Emergency lighting heads: 2300 mm (90")

1.16. FIELD QUALITY CONTROL

1. All electrical work to be carried out by qualified, licensed electricians or apprentices as per the conditions of the Provincial Act respecting manpower vocational training and qualification. Employees registered in a provincial apprentice's program shall be permitted, under the direct supervision of a qualified licensed electrician, to perform specific tasks – the activities permitted shall be determined based on the level of training attained and the demonstration of ability to perform specific duties.

2. Conduct and pay for following tests:

    1. Power distribution system including phasing, voltage, grounding and load balancing.

    2. Circuits originating from branch distribution panels.

    3. All Special Systems: emergency generator

3. Furnish manufacturer's certificate or letter confirming the entire installation as it pertains to each system has been installed to manufacturer's instructions.

4. Insulation resistance testing.

    1. Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.

    2. Check resistance to ground before energizing.

5. Carry out tests in presence of Consultant.

6. Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

7. Submit test results for Consultant's review.

1.17. CONCRETE WORK

1. Provide 100mm concrete housekeeping pads for all floor mounted equipment, including: transformers, automatic transfer switches, switchboard, MCCs and panels.

1.18. EXCAVATION AND BACKFILLING

1. This Division shall be responsible for coordination for bedding of lines or equipment and for backfilling and compaction to 98% Standard Proctor Density.

1.19. DEMOLITION

1. Disconnect and make safe electrical equipment and services as required on site.

2. Be responsible for demolition and removal of electrical equipment and services designated on drawings for removal and as required by work unless specified otherwise under other

divisions.

3. Electrical work being removed by other division shall be carried out under direction of this division. Do all disconnecting prior to authorizing removal.

1.20. FIREPROOFING

1. Where cables or conduits pass through floors and fire rated walls, pack space between wiring and sleeve full with firestopping system to CAN 4-S115.

1.21. CUTTING, PATCHING AND FINISHING

1. All cutting, patching and finishing for electrical work shall be by this Section. Obtain approval before cutting any structural members. Upon removal of all conduit, wiring, light fixtures, equipment, etc., patch all holes and match existing finishes.

1.22. COORDINATION WITH EXISTING UTILITIES

1. Before commencing any Work, the Contractor shall determine the locations of all underground utilities and structures indicated in or inferable from the Contract Documents, or that are inferable from an inspection of the Place of the Work.

2. All existing utilities are to be maintained and protected for the length of construction.

3. Contractor to notify consultant if any conflicts arise and allow for minimum 48 hours for consultant's review.

1.23. EXISTING SYSTEMS

1. Before submitting tender price verify on job site location of all accessible existing electrical systems affecting execution of this contract. Difficulties arising during construction will not be considered as grounds for additional payment.

2. Where work involves breaking into or connecting to existing systems, carry out work at times directed by governing authorities, with minimum of disturbance to pedestrian traffic.

3. Submit schedule to and obtain approval from Consultant for any shut down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.

4. Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.

1.24. OWNER OCCUPANCY SCHEDULE

1. The existing building will remain occupied during normal occupancy hours.

2. Provide temporary protection for all finishes, appliances or equipment in the existing building.

3. Protect and maintain existing boiler room and electrical room operations during the work.

END OF SECTION 26 05 00

PART 1 - GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

1.2. REFERENCES

1. CSA C22.2 No. 65-13 Wire Connectors.
2. EEMAC 1Y-2, 1961 Bushing Stud Connectors and Aluminum Adapters (1200 Ampere Maximum Rating).

PART 2 - PRODUCTS

2.1. MATERIALS

1. Pressure type wire connectors: with current carrying parts of copper sized to fit copper conductors as required.
2. Fixture type splicing connectors: with current carrying parts of copper sized to fit copper conductors 10 AWG or less.
3. Bushing stud connectors: to EEMAC 1Y-2 to consist of:
    1. Connector body and stud clamp for stranded copper conductors.
    2. Clamp for stranded copper conductors
    3. Stud clamp bolts.
    4. Bolts for copper conductors
    5. Sized for conductors as indicated.
4. Clamps or connectors for armoured cable, flexible conduit, as required.

PART 3 - EXECUTION

3.1. INSTALLATION

1. Remove insulation carefully from ends of conductors and:

1. Apply coat of zinc joint compound on aluminum conductors prior to installation of connectors.

2. Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CSA C22.2 No.65.

3. Install fixture type connectors and tighten. Replace insulating cap.

4. Install bushing stud connectors in accordance with EEMAC 1Y-2.

END OF SECTION 26 05 20

PART 1- GENERAL

1.1. RELATED SECTIONS

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.
2. Section 26 05 20 – Wire and Box Connections – 0 – 1000V.

1.2. REFERENCES

1. CSA C22.2 No. 0.3-09, Test Methods for Electrical Wires and Cables.

1.3. PRODUCT DATA

1. Submit product data in accordance with Division 1.

1.4. WASTE MANAGEMENT AND DISPOSAL

1. Separate and recycle waste materials in accordance with Division 1.
2. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Division 1.
3. Fold up metal banding, flatten and place in designated area for recycling.

PART 2- PRODUCTS

2.1. GENERAL

1. All conductors to be copper, unless otherwise noted.

2.2. BUILDING WIRES

1. Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG for power and # 16 AWG for controls and fire alarm.
2. Copper conductors: size as indicated, with insulation of chemically cross-linked thermosetting polyethylene material type RW90, or with thermoplastic insulation and nylon jacket, type T-90 nylon.
3. 600V rating for nominal 208V system voltage; 1000V rating for nominal 600V system voltage.

4. All outdoor circuit conductors to be type RWU90, unless otherwise noted.

5. Wire and conduit sizes shown are based on RW75 XLPE and are minimum sizes. Contractor is responsible for wire and conduit sized for other approved wires.

6. Conductors shall be colour coded. Conductors size 10 AWG and smaller shall have colour impregnated into insulation at time of manufacture.

    1. Colour code wiring for 120 / 208 Volt equipment as follows

        1. Phase conductors: Red, Black, Blue

        2. Neutral conductors: White

        3. Bonding to ground: Green

    2. Colour code wiring for 347 / 600 Volt equipment as follows

        1. Phase conductors: Red, Black, Blue

        2. Neutral conductors: White

        3. Bonding to ground: Green

2.3. CONTROL CABLES

1. Type LVT: 2 soft annealed copper conductors sized as indicated with thermoplastic insulation and outer covering thermoplastic jacket.

2. Plenum rated cable (FT-6) required in ceiling space where not in conduit.

2.4. FIRE ALARM WIRES

1. Copper conductors: size as per fire alarm manufacturer's recommendation, with thermoplastic insulation and nylon jacket, type TWH rated at 600 V for size #14 AWG and larger, type TEW for size #16 AWG and smaller.

PART 3 - EXECUTION

3.1. INSTALLATION OF BUILDING WIRES

1. Install wiring in conduit in accordance with Section 26 05 34, unless otherwise noted.

2. Use type RW90 where required by Ontario Electrical Safety Code, for all panelboard feeders and for all conductors sized 250 MCM and larger.

3. Use type RW90 or T-90 for branch circuit wiring unless otherwise indicated.

4. Minimum wire size shall be No. 12 AWG. For 15A, 120V branch circuit home runs which exceed 23 m length shall be minimum No. 10 AWG, and minimum No. 8 AWG for runs which exceed 36 m. For 20A, 120V branch circuit home runs which exceed 17 m in length shall be minimum No. 10 AWG, and minimum No. 8 AWG for runs which exceed 27 m. Where existing wiring is re-used, minimum wire sizes shall apply and wiring shall be replaced when it does not meet the minimum size.

5. Existing wiring may only be re-used if permitted by Engineer.

3.2. INSTALLATION OF CONTROL CABLES

1. Install control cables in conduit in accordance with Section 26 05 34.

2. Ground control cable shield.

3.3. INSTALLATION OF FIRE ALARM WIRE

1. Install all wiring in conduit in accordance with Section 26 05 34.

END OF SECTION 26 05 21

PART 1- GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

PART 2- PRODUCTS

2.1. EQUIPMENT

1. Rod electrodes: copper clad steel 19 mm dia by 3 m long.
2. Plate electrodes: copper, minimum surface area 0.2 m^2 and 6 mm thick.
3. Grounding conductors: bare stranded copper, soft annealed, size as indicated.
4. Non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:
    1. Grounding and bonding bushings.
    2. Protective type clamps.
    3. Bolted type conductor connectors.
    4. Thermit welded type conductor connectors.
    5. Bonding jumpers, straps.
    6. Pressure wire connectors.

PART 3- EXECUTION

3.1. INSTALLATION GENERAL

1. Install complete permanent, continuous grounding system including, electrodes, conductors, connectors, accessories, as indicated, to conform to requirements of consultant, and Inspection Authority. 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. Make buried connections using Burndy compression connectors.

5. Use mechanical connectors for grounding connections to equipment provided with lugs.

6. Soldered joints not permitted.

7. Make grounding connections in radial configuration only, with connections terminating at single grounding point. Avoid loop connections.

8. Bond single conductor, metallic armoured cables to cabinet at supply end, and provide non-metallic entry plate at load end.

3.2. ELECTRODES

1. Install grounding electrodes and make grounding connections.

2. Plate electrodes to be located a minimum 600mm below finished grade level.

3. Where ground rods are used, provide at least two ground rods, located at least 3 meters apart and buried to a minimum depth of 3 meters.

4. Bond separate, multiple electrodes together.

5. Use size #2/0 AWG copper conductors for connections to electrodes.

6. Make special provision for installing electrodes that will give [acceptable] resistance to ground value where rock or sand terrain prevails. Ground as indicated.

3.3. EQUIPMENT GROUNDING

1. Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, transformers, switchgear, duct systems, frames of motors, motor control centres, starters, control panels, building steel work, generators, elevators and escalators, distribution panels and outdoor lighting.

3.4. FIELD QUALITY CONTROL

1. Perform tests in accordance with Section 26 05 00 - COMMON WORK RESULTS - ELECTRICAL.

2. Perform ground continuity using method appropriate to site conditions and to approval of Consultant and Inspection Authority.

    1. Ground continuity: Ensure, through ground loop resistance measurement, that the grounding for the new equipment is tied in satisfactorily to the existing ground grid. Continuity measurements should be made between new equipment and system grounds of existing 600V services.

2. Perform tests before energizing electrical system.

3. Coordinate scheduling of tests with testing agency. Provide all test results to consultant.

END OF SECTION 26 05 28

PART 1 - GENERAL

1.1. RELATED WORK

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

2. 26 05 00 – Common Work Results – Electrical.

PART 2 - PRODUCTS

2.1. SUPPORT CHANNELS

1. U shape, size 41 x 41 x 2.5 mm thick, surface mounted or suspended.

2. Smaller sections subject to Consultant's approval.

PART 3 - EXECUTION

3.1. INSTALLATION

1. Secure equipment to tile and plaster surfaces with nylon anchors, with independent grip protrusions.

2. Secure equipment to poured concrete with expandable inserts.

3. Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.

4. Secure equipment to Siporex ceiling with Aircrete anchors equal to Fischer p/n:GB14.

5. Secure surface mounted equipment with twist clip fasteners to inverted T bar ceilings. Ensure that T bars are adequately supported to carry weight of equipment specified before installation.

6. Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.

7. Fasten exposed conduit or cables to building construction or support system using straps.

    1. One-hole steel straps to secure surface conduits and cables 50 mm and smaller.

    2. Two-hole steel straps for conduits and cables larger than 50 mm.

3. Beam clamps to secure conduit to exposed steel work.

8. Suspended support systems.

   1. Support individual cable or conduit runs with 6 mm dia threaded rods and spring clips.

   2. Support 2 or more cables or conduits on channels supported by 6 mm dia threaded rod hangers where direct fastening to building construction is impractical.

9. For surface mounting of two or more conduits use channels at 3 m oc spacing.

10. Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.

11. Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.

12. Do not use wire lashing or perforated strap to support or secure raceways or cables.

13. Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of Consultant.

14. Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.

15. Provide minimum 2400 mm support channel on each suspended fixture in open areas, with rigid stem supports from structure to channel, and fixture secured to channel.

16. All fastenings and supports to be hot dipped galvanized. All cut ends exposing base material to be completely sealed with field applied coating to give equivalent protection prior to installation. Following complete installation, all damage to protective layer to be carefully and completely touched up with same field applied coating.

END OF SECTION 26 05 29

PART 1- GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

1.2. REFERENCES

1. CSA C22.1-12 Canadian Electrical Code, Part 1.

1.3. WASTE MANAGEMENT AND DISPOSAL

1. Separate and recycle waste materials in accordance with Division 1, and with the Waste Reduction Workplan.

2. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Division 1.

PART 2- PRODUCTS

2.1. OUTLET AND CONDUIT BOXES - GENERAL

1. Size boxes in accordance with CSA C22.1.

2. 102 mm (4") square or larger outlet boxes as required for special devices.

3. Gang boxes where wiring devices are grouped.

4. Blank cover plates for boxes without wiring devices.

5. Combination boxes with barriers where outlets for more than one system are grouped.

2.2. SHEET STEEL OUTLET BOXES

1. Electro-galvanized steel single and multi gang flush device boxes for flush installation, minimum size 76 x 50 x 38 mm or as indicated. 102 mm (4") square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.

2. Electro-galvanized steel utility boxes for outlets connected to surface-mounted EMT conduit, minimum size 102 x 54 x 48 mm

3. 102 mm (4") square or octagonal outlet boxes for lighting fixture outlets.

4. 102 mm (4") square outlet boxes with extension and plaster rings for flush mounting devices in finished tile walls.

2.3. CONDUIT BOXES

1. Cast FS or FD feraloy boxes with factory-threaded hubs and mounting feet for surface wiring of switches and receptacle.

2. Electro-galvanized utility tape for indoor surface wiring.

2.4. FITTINGS - GENERAL

1. Bushing and connectors with nylon insulated throats.

2. Knock-out fillers to prevent entry of debris.

3. Conduit outlet bodies for conduit up to 35 mm and pull boxes for larger conduits.

4. Double locknuts and insulated bushings on sheet metal boxes.

PART 3- EXECUTION

3.1. INSTALLATION

1. Support boxes independently of connecting conduits.

2. Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.

3. For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm of opening.

4. Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Reducing washers are not allowed.

END OF SECTION 26 05 32

PART 1- GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

1.2. REFERENCES

1. Canadian Standards Association (CSA)
    1. CSA C22.2 No. 18-98 (R2003), Outlet Boxes, Conduit Boxes, and Fittings and Associated Hardware.
    2. CSA C22.2 No. 45.2-08, Rigid Metal Conduit.
    3. CSA C22.2 No. 56-04 (R2009), Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
    4. CSA C22.2 No. 83-M1985(R2013), Electrical Metallic Tubing.
    5. CSA C22.2 No. 211.2-06 (R2011), Rigid PVC (Unplasticized) Conduit.
    6. CSA C22.2 No. 227.3-05 (R2010), Flexible Non-metallic Tubing.

1.3. WASTE MANAGEMENT AND DISPOSAL

1. Separate and recycle waste materials in accordance with Division 1.
2. Place materials defined as hazardous or toxic waste in designated containers.
3. Ensure emptied containers are sealed and stored safely for disposal away from children.
4. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Division 1.

PART 2- PRODUCTS

2.1. CONDUITS

1. Electrical metallic tubing (EMT): with steel couplings, sized as indicated.
2. Rigid PVC conduit, sized as indicated.

3. Flexible metal conduit and liquid-tight flexible metal conduit, sized as indicated.

2.2. CONDUIT FASTENINGS

1. One hole steel straps to secure surface conduits 50 mm (2") and smaller. Two hole steel straps for conduits larger than 50 mm (2").

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

3. Channel type supports for two or more conduits at 3 m (9') o/c.

4. 6 mm dia threaded rods to support suspended channels.

2.3. CONDUIT FITTINGS

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

2. Fittings to be suitable sized for conduit used.

3. Fittings used for EMT to be steel, not cast.

4. Factory "ells" where 90° bends are required for 25 mm (1") and larger conduits.

2.4. EXPANSION FITTINGS FOR RIGID CONDUIT

1. Weatherproof expansion fittings with internal bonding assembly suitable for 100 or 200 mm linear expansion.

2. Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection in all directions.

3. Weatherproof expansion fittings for linear expansion at entry to panel.

2.5. FISH CORD

1. Polypropylene.

PART 3- EXECUTION

3.1. INSTALLATION

1. Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.

2. Conceal conduits except in mechanical and electrical service rooms and in unfinished areas.

3. Use electrical metallic tubing (EMT) above 2.4 m not subject to mechanical injury.

4. Use rigid PVC conduit for installation underground and in slabs.

5. Use liquid tight flexible metal conduit for final connection to a vibrating piece of equipment.

6. Bend conduit cold. Replace conduit if kinked or flattened more than 1/10th of its original diameter.

7. Mechanically bend steel conduit over 21 mm diameter.

8. All unterminated conduit ends to be reamed and protected by insulating bushings.

9. Install fish cord in empty conduits and all conduits 53 mm and greater.

10. Where conduits become blocked, remove and replace blocked section. Do not use liquids to clean out conduits.

11. Dry conduits out before installing wire.

12. Use water tight fittings at connections to taps or sides of sprinkler proof equipment or seal with approved sealant.

3.2. SURFACE CONDUITS

1. Run parallel or perpendicular to building lines.

2. Locate conduits behind infrared or gas fired heaters with 1500 mm clearance.

3. Run conduits in flanged portion of structural steel.

4. Group conduits wherever possible on suspended channels.

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

6. Do not locate conduits less than 75 mm (3") parallel to steam or hot water lines with minimum of 25 mm (1") at crossovers.

7. All exposed conduits in areas other than service spaces are to be painted to match existing finishes.

3.3. CONCEALED CONDUITS

1. Run parallel or perpendicular to building lines.

3.4. CONDUITS UNDERGROUND

1. Slope conduits to provide drainage and prevent moisture or gases from entering the building.

2. Waterproof joints (PVC excepted) with heavy coat of bituminous paint.

END OF SECTION 26 05 34

PART 1- GENERAL

1.1. RELATED SECTIONS

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

2. Section 26 05 00 – Electrical General Requirements.

PART 2- PRODUCTS

2.1. PVC DUCTS

1. PVC ducts, type DB2

2.2. PVC DUCT FITTINGS

1. Rigid PVC opaque solvent welded type couplings, bell end fittings, plugs, caps, adaptors as required to make complete installation.

2. Expansion joints.

3. Rigid PVC 5 angle couplings.

PART 3- EXECUTION

3.1. DUCT INSTALLATION

1. Install underground duct banks.

2. Build duct bank on undisturbed soil or on well compacted granular fill not less than 150mm (6”) thick, compacted to 95% of maximum proctor dry density.

3. Open trench completely between manholes to be connected before ducts are laid and ensure that no obstructions will necessitate change in grade of ducts.

4. Install ducts at elevations and with slope as indicated and minimum slope of 1 to 400.

5. Install base spacers at maximum intervals of 1.5 m (5’) levelled to grades indicated for bottom layer of ducts.

6. Lay PVC ducts with configuration as indicated with preformed interlocking, rigid plastic intermediate spacers to maintain spacing between ducts at not less than 75mm (3”) horizontally and vertically. Stagger joints in adjacent layers at least 150mm (6”) and make joints watertight.

7. Make transpositions, offsets and change in direction using 5° bend sections, do not exceed a total of 20° with duct offset.

8. Use bell ends at duct terminations in manholes or buildings.

9. Use conduit to duct adapters when connecting to conduits.

10. Terminate duct runs with duct coupling set flush with the end of concrete envelope when dead ending duct bank for future extension.

11. Cut, ream and taper end of ducts in field in accordance with manufacturer's recommendations, so that duct ends are fully equal to factory-made ends.

12. Clean ducts before laying. Cap ends of ducts during construction and after installation to prevent entrance of foreign materials.

13. After installation of ducts, pull through each duct a wooden mandrel not less than 300mm (12") long and of a diameter of 6mm (1/4") less than internal diameter of duct, followed by stiff bristle brush to remove sand, earth and other foreign matter. Pull stiff bristle brush through each duct immediately before pulling-in cables.

14. In each duct install pull rope continuous throughout each duct run with 3m (10') spare rope at each end.

3.2. CABLE INSTALLATION IN DUCTS

1. Installation of high voltage power cables, conduits, etc. will be by electrical contractor, unless otherwise noted.

2. Primary duct banks and manholes are existing to remain.

3. Install cables as indicated in ducts.

4. Do not pull spliced cables inside ducts.

5. Install multiple cables in duct simultaneously.

6. Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension.

7. To facilitate matching of colour coded multi-conductor control cables reel off in same direction during installation.

8. Before pulling cable into ducts and until cables properly terminated, seal ends of lead covered cables with wiping solder; seal ends of non-leaded cables with moisture seal tape.

9. After installation of cables, seal duct ends with duct sealing compound to prevent entrance of moisture or gases.

10. Service entrance raceway shall contain no other than the service entrance conductors.

3.3. MARKERS

1. Mark ducts every 50’ along straight runs and changes in direction.

2. Provide drawings showing locations of markers.

3.4. AS-BUILTS

1. Provide As-Built drawings, indicating location of all underground conductor, cable or raceway installations including depth of burial and type of installation.

3.5. FIELD QUALITY CONTROL

1. Perform tests in accordance with Section 16010 - Electrical General Requirements.

2. Perform tests using qualified personnel. Provide necessary instruments and equipment.

3. Check phase rotation and identify each phase conductor of each feeder.

4. Check each feeder for continuity, short circuits and grounds. Ensure resistance to ground of circuits is not less than 50 megohms.

5. Pre-Acceptance Tests:

    1. After installing cable but before splicing and terminating, perform insulation resistance test with 1000 V megger on each phase conductor.

    2. Check insulation resistance after each splice and/or termination to ensure that cable system is ready for acceptance testing.

6. Acceptance Tests:

    1. Ensure that terminations and accessory equipment are disconnected.

    2. Ground shields, ground wires, metallic armour and conductors not under test.

    3. Leakage Current Testing:

        1. Raise voltage in steps from zero to maximum values as specified by manufacturer for type of cable being tested.

        2. Hold maximum voltage for time period specified by manufacturer.

        3. Record leakage current at each step.

    4. High Potential (Hipot) Testing shall be completed in the factory.

        1. Conduct Hipot Testing in accordance with IPCEA recommendations.

7. Provide Engineer with list of test results showing location at which each test was made, circuit tested and result of each test.

8. Remove and replace entire length of cable if cable fails to meet any of the test criteria.

END OF SECTION 26 05 44

PART 1- GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

2. This section defines dry-type transformers designed to meet the following regulations:

    1. NRCan (Natural Resources Canada), Energy Efficiency Act SOR/2016 - 311, amendment 14.

    2. Ontario Green Energy Act, revised by ON Reg.404-12 effective January 1st, 2018.

1.2. PRODUCT DATA

1. Submit product data in accordance with Division 1.

PART 2- PRODUCTS

2.1. TRANSFORMERS

1. Use transformers of one manufacturer throughout project.

2. Energy Efficiency Levels to NRCan 2018/19 and ON Reg.404-12 – effective as of Jan. 1, 2018 (in Ontario).

3. Type 1: General Purpose**.**

    1. Design

        1. Type: ANN, aluminum winding.

        2. Single or 3 phase, 60 Hz, size primary voltage, secondary voltage and kVA as indicated.

        3. Voltage taps on primary to be full capacity, two 2.5% above and two 2.5% below normal.

        4. Insulation: Class 220°C, 150°C temperature rise.

        5. Basic Impulse Level: 10kV

        6. Hipot: standard

7. Average sound level: standard

8. Impedance at 170°C: standard

9. Enclosure: ventilated NEMA 3R, front accessible.

10. Mounting: floor, unless indicated otherwise.

11. Finish: in accordance with 26 05 00 – Common Work Results – For Electrical.

12. Sprinkler Drip Shields

2.2. ACCEPTABLE MANUFACTURERS

1. Eaton, Hammond, Schneider, Rex Power Magnetics

PART 3- EXECUTION

3.1. INSTALLATION

1. Mount dry type transformers up to 75 kVA as indicated.

2. Mount dry type transformers 75 kVA and above on floor.

3. Provide 100mm concrete housekeeping pad under equipment.

4. Ensure adequate clearance around transformer for ventilation and to meet Code requirements.

5. Install transformers in level upright position.

6. Remove shipping supports only after transformer is installed and just before putting into service.

7. For transformers installed on the floor slab, provide vibration isolation pads.

8. For transformers installed on brackets attached to the wall, provide spring vibration isolators, minimum static deflection of 6 mm.

9. Loosen isolation pad bolts until no compression is visible or as per manufacturer’s recommendations.

10. Make primary and secondary connections in accordance with wiring diagram.

11. Energize transformers immediately after installation is complete, where practical.

12. Provide ground wire from main service ground to neutral point of secondary windings, sized to Code. Run in primary feeder conduit, and bond to transformer case to satisfaction of Inspection Authority.

13. Provide flexible conduit connections for last one (1) meter in each conduit.

END OF SECTION 26 12 17

PART 1 - GENERAL

1.1. SCOPE

1. Contractor shall furnish, deliver, install and test the quick connection cabinets as specified herein and in accordance with the drawings.

2. Voltage, Phase Configuration, Bracing and Interrupting Rating (if applicable) as per supplied single line.

1.2. QAULITY ASSURANCE

1. Quick connection cabinet shall be listed under the UL 891 or CSA C22.2 No. 76 standard. SPE-1000 or panel designation not acceptable.

2. Connection cabinet manufacturer shall provide a complete factory assembled and tested connection cabinet.

3. All units to be Insulation tested to 2500VDC.

4. All internal power conductors to be 600VAC or greater.

1.3. SUBMITTALS

1. Contractor shall submit manufacturer’s drawings and data of connection cabinet for Engineer’s approval prior to start of fabrication. Drawings and data shall include, as a minimum, dimensioned general arrangement drawings, UL or CSA listing information including UL control or file number, component data, mounting provisions, conduit entry locations and installation instructions.

2. Provide installation manual for Engineer’s review at the time of submittal.

1.4. WARRANTY

1. All products shall be free from defects in materials and workmanship for a period of 1 year from date of its plant shipment.

PART 2 - PRODUCTS

2.1. GENERAL

1. Provide a three-way, manual transfer switch connection cabinet which allows for isolated load bank testing and portable generator tie-in at the same time.

2. Cabinet ratings: 600A, 600V (3PH + G), 25kAIC

3. All equipment shall be new.

4. Contractor shall be responsible for the equipment until it has been installed and is finally inspected, tested and accepted in accordance with the requirements of this Specification.

2.2. MATERIALS

1. Connection cabinet enclosure shall be Type 3R, constructed of continuous seam-welded, powder coated Aluminum. The main access shall be through a hinged door that extends the full height of the enclosure. Access for cables shall be via a) drawn flange cable entry openings in the bottom of the enclosure for wall mount units, or b) hinged lower door for pad mount units. A hinged flap door shall be provided to cover the cable openings when cables are not connected; the hinged flap door shall allow cable entry only after the main access door has been opened. Enclosure shall be powder coated after fabrication; color shall be wrinkle gray RAL 7035.

2. Bottom access door should run complete width of enclosure and should not be capable of opening with main door closed. Bottom latch accessible only from within enclosure.

3. All hinges to be stainless steel and quick release type to allow for quick replacement of doors or to ease installation.

4. Door lock to be three-point type. Pad lock hasp should be integrated into door handle.

5. All connection cabinets to have integrated cable rake to insure operator protection and inability to disconnect plugs with enclosure's main door closed.

6. All power bus-work to be tin plated copper to be at minimum 1 square inch / 1000 amps. Aluminum bus not acceptable.

7. Cabinet shall be equipped with three interlocked, moulded case circuit breakers to enable switching between permanent generator, load bank and/or portable generator.

8. Circuit breaker for permanent generator shall be equipped with an LSI trip unit. Load bank and portable generator breakers shall be thermal magnetic.

9. All connections are bottom entry / bottom exit.

2.3. LOAD BANK CONNECTIONS

1. Load bank connectors shall consist of single pole Eaton E1016 type cam-style female connectors and grounding terminals housed within a pad-lockable enclosure.

2. Cam-style female connectors (inlets) shall be UL Listed, single-pole separable type, two per phase and rated at 600VAC. Cam-style female connectors shall be color coded. Cam- style female connectors shall be provided for each phase and for ground. The ground cam-style female connectors shall be bonded to the enclosure, and a ground lug shall be provided for connection of the facility ground conductor.

None of the cam-style female connectors shall be accessible unless the main access door is open.

3. Cam plate must be conductive metal with respective phase indication mechanically etched into plate. Stickers or labels are not acceptable.

4. Each cam-lock phase to be complete with weatherproof, color matching, spring loaded cover plate.

2.4. PORTABLE GENERATOR CONNECTIONS

1. Portable generator connectors shall consist of single pole Eaton E1016 type cam-style male connectors and grounding terminals housed within a pad-lockable enclosure.

2. Cam-style male connectors (inlets) shall be UL Listed single-pole separable type, two per phase and rated at 600VAC. Cam-style male connectors shall be color coded. Cam- style male connectors shall be provided for each phase and for ground and shall also be provided for neutral if required. The ground cam-style male connectors shall be bonded to the enclosure, and a ground lug shall be provided for connection of the facility ground conductor. None of the cam-style male connectors shall be accessible unless the main access door is open.

3. Cam plate must be conductive metal with respective phase indication mechanically etched into plate. Stickers or labels are not acceptable.

4. Each cam-lock phase to be complete with weatherproof, color matching, spring loaded cover plate.

2.5. ACCEPTABLE MANUFACTURER

1. Foxfab Power Solutions, FFCC-S1 Series

PART 3- EXECUTION

3.1. INSTALLATION

1. Prior to installation of connection cabinets, Contractor shall examine the areas and conditions under which the connection cabinet is to be installed and notify the Engineer in writing if unsatisfactory conditions exist.

2. Connection cabinet shall be installed as shown on the drawings and per the manufacturer’s installation instructions.

3. Ensure upstream devices are off. Lock out and ensure connection cables are voltage free before performing any electrical connections.

3.2. FIELD TESTING

1. Prior to energizing connection cabinet, the Contractor shall perform the following checks and tests as a minimum:
    1. Verify mounting and connections are complete and secure to torque requirements as indicated by installation manual.
    2. Ensure internal components and wiring are secure.
    3. Perform continuity check of all circuits.
    4. Confirm all enclosure grounding is in place and has an overall continuity of less than 1 ohm from incoming GRD lug/cam-loc.
    5. Perform 1,000 VDC megger test on phase and ground cables.
    6. Verify dead-front is secure and all warning labels are undamaged and clearly visible.
    7. Confirm operation of the connection cabinet ground receptacle by attaching a plug to the connection cabinet ground receptacle and then verify that the plug is grounded to the facility ground.

END OF SECTION 26 12 20

PART 1- GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

1.2. SHOP DRAWINGS

1. Submit shop drawings in accordance with Division 1.

2. Drawings to include electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.

1.3. PLANT ASSEMBLY

1. Install circuit breakers in panelboards before shipment.

2. In addition to CSA requirements manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.

PART 2- PRODUCTS

2.1. PANELBOARDS

1. Panelboards: product of one manufacturer.

2. Bus and breaker rated for the following symmetrical interrupting capacity, unless otherwise indicated. **Series rated panels are not acceptable.**

    1. 347/600 V Panelboards – 25 kAIC

    2. 120 / 208 V Panelboards – 10 kA I.C.

        Refer to singleline diagram for other values.

3. Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.

4. Panelboards: mains, number of circuits, and number and size of branch circuit breakers as indicated.

5. Each panelboard to be equipped with integral lock and be complete with two keys. All

panelboards to be keyed alike.

6. Aluminum bus with neutral of same ampere rating as mains.

7. Mains: suitable for bolt-on breakers.

8. Trim and door finish: baked grey enamel

9. Panelboards on emergency power to be labeled in RED.

10. Surface mounted panelboards not located in electrical or storage rooms shall be supplied with floor to ceiling enclosures to maximum height of 3.6 m to conceal conduit.

11. Panelboards to be equipped with sprinkler shields.

12. Provide 15% space for future breakers in all 120/208V panels and 25% space in all 600V panels, unless otherwise noted.

13. Feed thru lugs as indicated.

14. NEMA 1 enclosure.

2.2. BREAKERS

1. Breakers: to Section 26 28 21 - Moulded Case Circuit Breakers.

2. Breakers with thermal and magnetic tripping in panelboards except as indicated otherwise.

3. Main breaker: separately mounted on top or bottom to suit cable entry. When mounted vertically, down position should open breaker.

4. Lock-on devices for fire alarm, emergency, door supervisory, intercom, stairway, exit and night light circuits.

2.3. EQUIPMENT IDENTIFICATION

1. Provide equipment identification in accordance with Section 26 05 00 – Common Work Results - Electrical.

2. Nameplate for each panelboard size 4 engraved, as indicated

3. Nameplate for each circuit in distribution panelboards size 2 engraved, as indicated.

4. Complete circuit directory with typewritten legend showing location and load of each circuit.

2.4. ACCEPTABLE MATERIALS

1. Schneider

2. Eaton

PART 3- EXECUTION

3.1. INSTALLATION

1. Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.

2. Mount panelboards to height specified in Section 26 05 00 – Common Work Results - Electrical or as indicated.

3. Connect loads to circuits.

4. Connect neutral conductors to common neutral bus with respective neutral identified.

3.2. PANELBOARD LAYOUTS

1. Follow panelboard details attached or on drawings, for layout of circuit and breaker sizes wherever possible.

2. Record all changes to panelboard details and submit as part of As-Built drawing set for review at completion of the project. Insert copies in each maintenance manual.

END OF SECTION 26 24 17

PART 1- GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

1.2. PRODUCT DATA

1. Submit product data in accordance with Division 1.

2. Include time-current characteristic curves for breakers with ampacity of 400A and over or with interrupting capacity of 22,000A symmetrical (rms) and over at system voltage.

PART 2- PRODUCTS

2.1. BREAKERS - GENERAL

1. Bolt-on moulded case circuit breaker: 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 multi-pole applications.

3. Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting. Trip settings on breakers with adjustable trips to range from 3-10 times current rating.

2.2. THERMAL MAGNETIC BREAKERS

1. Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

PART 3- EXECUTION

3.1. INSTALLATION

1. Install circuit breakers as indicated.

END OF SECTION 26 28 21

PART 1- GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

1.2. PRODUCT DATA

.1 Submit product data in accordance with Division 1.

PART 2- PRODUCTS

2.1. DISCONNECT SWITCHES

.1 Enclosed manual air break switches in non-hazardous locations to CSA C22.2 No. 4-04 (2009).

.2 Fuse holder assemblies to CSA C22.2 No. 39-13.

.3 Fusible and non-fusible disconnect switch in CSA Enclosure size as indicated.

.4 Provision for padlocking in on-off switch position by three locks.

.5 Mechanically interlocked door to prevent opening when handle in ON position.

.6 Fuses: size as indicated, to Section 26 28 14 - Fuses - Low Voltage.

.7 Fuse holders: suitable without adaptors, for type and size of fuse indicated.

.8 Quick-make, quick-break action.

.9 ON-OFF switch position indication on switch enclosure cover.

2.2. EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Section 26 05 00 – Common Work Results - Electrical.

.2 Indicate name of load controlled on size 4 nameplate.

2.3. ACCEPTABLE MATERIALS

.1 Siemens

.2 Square D

.3 Eaton

.4 Alternate materials as approved by addendum in accordance with General Instructions.

PART 3- EXECUTION

3.1. INSTALLATION

.1 Install disconnect switches complete with fuses, if applicable.

.2 For all disconnects where fuse and wire sizes have a lower rating then the disconnect, a lamacoid label is to be applied indicating “MAX FUSE SIZE TO BE ____ AMPS”. To be filled in with the value of the specific fuse size.

END OF SECTION 26 28 23

PART 1 - GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

1.2. DESCRIPTION OF SYSTEM

1. Provide a 400 kW, 600V, 3 phase, 3 wire natural gas, standby generator to supply electrical power in the event of failure of the normal supply, consisting of a liquid cooled engine, an AC alternator and system controls with all necessary accessories for a complete operating system, including but not limited to:

2. Generating system consists of:

    1. gas engine,

    2. alternator,

    3. alternator control panel,

    4. battery charger, heater and battery,

    5. gas supply system,

    6. exhaust system,

    7. structural steel mounting base,

    8. sound attenuated weather-proof outdoor enclosure, with acoustically treated intake and air relief, with motorized damper,

    9. base support,

    10. enclosure mounted stack,

    11. block heater,

    12. 60A, 120 / 240V, 1 phase, 3 wire outdoor enclosure load centre and enclosure lighting,

    13. outdoor enclosure cooling, heating and ventilation system, with all necessary controls,

    14. radiator and cooling system,

3. System designed to operate as emergency standby.

4. Emergency generator package to be pre-wired with all loads, such as battery charger, block heater, lighting, motorized dampers and electric force flow heater connected to load centre.

1.3. SHOP DRAWINGS

1. Submit shop drawings in accordance with Division 1.

2. Include:

    1. engine: make and model, with performance curves,

    2. alternator: make and model,

    3. voltage regulator: make, model and type,

    4. control panel and main breaker,

    5. generator decrement curves against generator main breaker curve,

    6. battery: make, type and capacity,

    7. battery charger: make, type and model,

    8. battery heater: make, type and model,

    9. alternator control panel: make and type of meters and controls

    10. governor type and model,

    11. vibration pads

    12. cooling air requirements in m^3/s and maximum fan pressure – min. 125 PA required,

    13. ISO rating of engine,

    14. flow diagrams for:

        1. gas fuel

        2. lubricating oil

        3. cooling air

    15. dimensioned drawing showing complete generating set mounted on steel base, including vibration isolators, sound attenuated weather-proof outdoor enclosure, exhaust system and total weight,

    16. continuous full load output of set at 0.8 PF lagging,

    17. description of set operation including:

1. automatic starting and transfer to load and back to normal power, including time in seconds from start of cranking until unit reaches rated voltage and frequency,

2. manual starting,

3. automatic shut down and alarm on:

    1. Overcranking
    2. Overspeed
    3. High engine temp
    4. Low lube oil pressure
    5. Short circuit
    6. Alternator overvoltage
    7. Lube oil high temperature
    8. Thermistor over temperature on alternator

4. Manual remote emergency stop.

18. Enclosure Details

19. Sound attenuation data.

20. Emissions Data Sheet – with NOx, THC and CO.

1.4. QUALITY CONTROL SUBMITTALS

1. Prepare complete electronic set of documents for distribution and include:

    1. Reviewed drawings as above with as-built deviations, if any, marked thereon.

    2. Wiring diagram of control panel, engine and interconnections.

    3. Specific instructions for installation of equipment instructions for placing equipment into operation.

    4. Description of operation with reference to the schematic wiring diagram.

    5. Engine manual including operating and parts information.

    6. Generator and voltage regulator manual(s) including wiring and assembly drawings.

    7. Battery charger manual, including wiring diagram and parts list.

    8. Transfer switch manual and parts list (if switch is supplied).

    9. Test report per factory inspection and test procedures.

1.5. OPERATION AND MAINTENANCE DATA

1. Provide operation and maintenance data for natural gas generator for incorporation into

maintenance manual.

2. Include in Operation and Maintenance Manual Instructions for particular unit supplied and not general description of units manufactured by supplier, and:

    1. operation and maintenance instructions for engine, alternator, control panel, battery charger, battery, gas supply system, enclosure ventilation system, exhaust system and accessories, to permit effective operation, maintenance and repair.

    2. technical data:

        1. illustrated parts lists with parts catalogue numbers,

        2. schematic diagram of electrical controls,

        3. flow diagrams for:

            1. Fuel system
            2. Lubricating oil
            3. Cooling system

        4. certified copy of factory test results,

        5. maintenance and overhaul instructions and schedules,

        6. precise details for adjustment and setting of time delay relays or sensing controls which are required on site adjustment.

1.6. MAINTENANCE MATERIALS

1. Provide maintenance materials in accordance with Division 1.

1.7. SOURCE QUALITY CONTROL

1. Factory test generator set including engine, alternator, control panels, and accessories.

2. The emergency generator may be factory tested at unity power factor if the alternator unit has been factory tested at rated power factor and load at the alternator manufacturer's facility.

3. A copy of the alternator manufacturer's factory test report shall be included with the alternator unit.

4. Submit certified copy of test results to Consultant for approval before shipment to site.

1.8. MANAGEMENT AND DISPOSAL

1. Separate and recycle waste materials in accordance with Division 01.

2. Remove from site and dispose of all packaging materials at appropriate recycling facilities.

3. Collect and separate for disposal: paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.

4. Divert unused wiring materials from landfill to metal recycling facility as approved by Engineer.

5. Place materials defined as hazardous or toxic in designated containers.

6. Divert unused lubricating oil materials from landfill to oil recycling facility approved by Engineer.

7. Divert unused antifreeze from landfill to antifreeze recycling facility approved by Engineer.

8. Fold up metal banding, flatten and place in designated area for recycling.

1.9. WARRANTY

1. Full warranty period for all components shall be 60 months or 1500 operating hours, whichever occurs first.

PART 2- PRODUCTS

2.1. NATURAL GAS – GENERATOR SET

1. Alternator and exciter, gas set, instruments, meters and switches shall be CSA approved.

2. Gas – generator performance and accessories shall conform to CSA Standard C282. Both sets to be identical.

2.2. GAS ENGINE

1. Gas engine: to ISO 3046/1 – 1981.

    1. engine: standard product of current manufacture, from company regularly engaged in production of such equipment.

2. Four cycle engine, synchronous speed 1800 r/min.

3. Capacity:

    1. rated continuous power in kW at 1800 r/min, after adjustment for power losses in auxiliary equipment necessary for engine operation; to be calculated as follows: rated continuous output = generator kW / generator Eff @ FL

        1. under following site conditions:

            1. Altitude: 100 feet

2. Ambient temperature: 104 degrees F
3. Relative humidity: 60%

2. engine overload capability 110% of continuous output for 1 h within 12 h period of continuous operation.

3. engine shall be sized to ensure that generator can deliver +/- 2% of its rated voltage and frequency within 15 seconds of loss of normal power.

4. Cooling System:

1. liquid cooled: heavy duty industrial radiator mounted on generating set base with engine driven pusher type fan to direct air through radiator from engine side. Thermostatically controlled, with ethylene glycol anti-freeze non-sludging above minus 50°F,

2. to maintain manufacturer's recommended engine temperature range at 10% continuous overload in ambient temperature of 104°F,

3. radiator complete with a flange for duct connection,

4. engine cooling system shall include built-in centrifugal type water circulating pump and thermostat to maintain proper jacket water temperature under each load condition.

5. provide radiator flexible duct connection,

6. the external static pressure of the diesel radiator fan shall not be less than 0.25 KPA at 38.24 cubic meters/second maximum,

7. readily accessible drain valves for draining coolant from engine and radiator.

8. Circuits supplying cooling system control equipment shall be connected ahead of generator disconnecting means and overcurrent devices.

5. Fuel:

1. Natural Gas – 10" WC pressure

6. Block heater:

1. plug connected, thermostatically controlled liquid coolant heater connected to line side of automatic transfer switch, able to maintain coolant around combustion chambers;

1. at a sufficiently high temperature to allow engine to start in room ambient 0°C as per requirements of clause 2.2.4.

2. All engine and generator heaters shall be automatically disconnected when the engine is running. Each heater shall have an independent means of being disconnected or switched off for maintenance.

7. Governor:

1. Electronic type.

2. Manual speed adjustment, micrometer screw type, also shutdown lever and overspeed stop.

3. ±0.5 speed regulation, steady state: No-load to full-load and full-load to no-load.

4. ±8% speed regulation, transient peak: no load to full load and full load to no load.

5. ±0.5 stability at any constant load and free from further hunting or oscillation.

6. Recovery time, from instant load change to steady state condition, better than three seconds.

8. Lubrication system:

1. pressure lubricated by engine driven pump,

2. lube oil filter: replaceable, full flow type, removable without disconnecting piping,

3. lube oil cooler,

4. engine sump drain valve,

5. oil level dip-stick,

6. lube oil pressure and temperature gauges.

7. Operational requirements are such that unit may lay idle for periods up to one month and then be required to start and assume full rated load within specified (15 seconds) time period. To protect service life of engine components, provide an electrical motor driven, integrally mounted, gear type oil priming pump with interval timer and breaker type combination starter. Starter mounted in control panel. Motor shall be of splash proof enclosure. Lubricating oil pressure switch to stop priming pump when engine is running. Where pump is not being provided, submit a letter certifying that oil pump is not required for this project and will not detract from service life of engine components.

9. Starting system:

1. positive shift, gear engaging starter 12 Vdc,

2. cranking limiter to provide 3 cranking periods of 10 s duration, each separated by 10 s rest,

3. Starting battery, heavy duty, lead acid 120V rated at minimum 925 CCA, sealed type, hard rubber cased. Ensure battery is of sufficient capacity to crank engine at 0 deg C (32 deg F) for 60 seconds continuously without voltage dropping below 80% rated voltage and without using more than 25% of ampere hour capacity. Provide all intercell and connecting battery cables as required.

4. Battery warmers: Thermostatically controlled, UL listed, factory-wired.

5. Battery rack with support legs, coated with acid resistant paint.

6. Heavy duty multi-strand cables of sufficient length and capacity to allow the battery to be located on either side of engine. Protect cables within properly-sized conduit.

7. Battery charger, 120V AC input, 10A and 12V output. Static and chassis type with automatic boost and float charging with transistorized voltage control and recycle timer, boost and float rate separately adjustable, input and output breakers, manual-automatic switch, current limit protection, voltmeter and ammeter.

8. Battery charger shall be capable of recharging a completely discharged battery to 80% of capacity within 4 hrs. and to full capacity in not more than 12 hrs.

9. Battery charger to be mounted inside of generator control panel unless indicated otherwise on Drawings.

10. Other features to include:

    1. AC input breaker,

    2. AC surge protection,

    3. soft start control,

    4. DC output fuse protection,

    5. current limit protection,

    6. digital voltmeter and ammeter (1% accuracy),

    7. pilot light indication for:

        1. AC power
        2. Float control
        3. Equalize control
        4. Soft start control

    8. automatic equalize after discharge complete with equalize timer, adjustable 1-30 hours,

    9. manual initiate, or terminate of equalize timer,

10. Engine oil drip tray, 16 AWG minimum, galvanized steel with 50mm (2”) lip suitable for location on floor between vibration isolators. Extend tray as far as possible to protect floor and be readily removable without disturbing any components. Tray may be in two parts.

2.3. ALTERNATOR

1. Alternator: to NEMA MG1-1978 and to CSA C22.2 No. 100-1978.

2. Rating: As Indicated on Drawings.

3. Output at 40°C ambient:

    1. 100% full load continuously,

4. Revolving field, brushless, single bearing.

5. Two bearings, pre-lubed and sealed, anti-friction type 50,000 hr. Minimum B.10 life.

6. Drip proof.

7. Self-ventilated.

8. Amortisseur windings.

9. Synchronous type.

10. Horizontal synchronous type in protected enclosure with ground lug and readily accessible terminal box.

11. Dynamically balanced rotor permanently aligned to engine by flexible disc coupling.

12. Exciter: permanent magnet pilot exciter.

13. Class H insulation on windings.

14. Voltage regulator: digital thyristor controlled rectifiers with phase controlled sensing circuit:

    1. stability: 0.25% maximum voltage variation at any constant load from no load to full load,

    2. regulation: 1.5% maximum voltage deviation between no-load steady state and full-load steady state,

    3. transient: stable supply voltage to be maintained for one-step application of maximum site design load. Reduction in frequency shall not exceed 10% and recovery time shall not exceed 3 sec.

15. Alternator: capable of sustaining 300% rated current for period not less than 10 s permitting selective tripping of down line protective devices when short circuit occurs.

16. Temperature rise not to exceed EEMAC MGI-22.40 for insulation class used and in 40 deg C (105 deg F) ambient. Provide hi temperature sensor and shutdown.

17. The transient dip in generator output voltage, as shown on an oscilloscope or undamped voltmeter, shall not exceed 25% at full voltage starting off an induction motor with starting KVA equal to the generator.

2.4. CONTROL PANEL

1. Totally enclosed, mounted on generator with vibration dampers.

2. Panel door with formed edges and lockable handle with 2 keys.

3. Flexible conductors between door and fixed panel.

4. Vibration isolated engine instrument panel with:

    1. lube oil pressure gauge,

    2. lube oil temperature gauge,

    3. coolant temperature gauge,

    4. elapsed time meter: non-tamper type.

    5. Digital voltmeter, ammeter, and phase selector switches

    6. Frequency meter that is not a reed type

5. The generator control system shall be a fully integrated and multi-purpose microprocessor based control system for standby emergency engine generators.

    1. This configuration shall contain a complete automatic engine start-stop control complete with engine start button, off-auto-manual selector switch, emergency stop button and provision for remote emergency stop button.

    2. The control panel shall display all pertinent unit parameters including:

        1. Generator Status - Current unit status in real time

        2. Engine operating conditions - Realtime readouts of the engine and alternator values:

            1. Oil pressure and optional oil temperature
            2. Coolant temperature and level
            3. Engine speed
            4. DC battery voltage
            5. Run time hours
            6. Generator voltages, amps, frequency
            7. Power factor

    3. Generator Commands

    4. Current engine start/stop status

    5. Alarm Status - Current alarm(s) condition

        1. Low or high AC voltage

        2. Low or high battery voltage

        3. Low or high frequency

        4. Pre-low or low oil pressure

5. Pre-high or high oil temperature (optional)

6. High, low and critical low fuel levels (where applicable)

7. Overcrank

8. Over and under speed

9. Unit not in “Automatic Mode”

6. Alarm Log

1. Memory of last twenty alarm events (date and time stamped)

7. Operating parameters

6. Operating lights, panel mounted

1. “Normal power” pilot light

2. “Emergency power” pilot light

3. Green pilot lights for breaker on and red pilot lights for breaker off

4. Lamp test button

7. Alternator output breaker:

1. One mainline, moulded case circuit breaker with LSI electronic trip unit, carrying the UL/CSA mark shall be factory installed on each generator. The breaker shall be rated between 100 to 125% of the rated ampacity of the genset.

2. Lockable in the closed position.

3. Breaker position to be monitored with local and remote annunciation.

8. Automatic shutdown and alarms with NO / NC contacts wired to terminal block for remote annunciation on:

1. engine overcrank,

2. engine overspeed,

3. engine high temperature,

4. engine low lube oil pressure,

9. Battery powered, alphanumeric, text-based display to indicate individual faults as per Table 1 of C282-15.

2.5. REMOTE ANNUNCITOR

1. Provides remote monitoring and LED annunciation of up to 18 generator parameters including low fuel level.

2. Form A output relays with selectable functions.

3. Power supplied from generator battery.

4. RS485 communication.

5. Compliant with NFPA 110.

6. Alarm Horn: 90dB @ 10cm

2.6. STRUCTURAL STEEL MOUNTING BASE

1. Complete generating set mounted on heavy-duty fabricated structural steel base of sufficient strength and rigidity to protect assembly from stress or strain and to maintain alignment during transportation, installation and under operating conditions on suitable level surface.

2. Sound insulation pads for installation between steel frame and concrete base.

3. Align engine and generator horizontally and vertically to within +/- .05mm, using steel shims where required. Provide machine bolts to secure units to base. Dowel feet of both units on two bearing generator assemblies.

4. Drive coupling, torsionally rigid flexible steel disc type, for connecting a single bearing generator to an engine via a S.A.E. housing.

2.7. WEATHER PROTECTIVE ENCLOSURE

1. The engine-generator set shall be factory enclosed in a heavy gauge steel enclosure constructed with 14 gauge corner posts, uprights and headers. Enclosure to be single wall construction insulated with sound absorbing insulation to 75 DBA @ 7 metres. The roof shall be made of aluminum, aid in the runoff of water and include a drip edge. The enclosure shall be coated with electrostatically applied powder paint, baked and finished to manufacturer's specification. The enclosure is to have large, hinged doors to allow access to the engine, alternator and control panel. The doors must lift off without the use of tools. Each door will have lockable hardware with identical keys. Padlocks do not meet this specification.

2. Enclosure shall be equipped with sound attenuated intake and exhaust air system, complete with motorized insulated dampers.

3. Enclosure shall be equipped with 1.5 kW – 120V SP blower operated heater complete with thermostat.

4. Provide heat detector 88°C ROR, connected to building fire alarm system.

5. Provide generator running status indicator and generator trouble status indicator connections to fire alarm panel.

6. Provide emergency battery pack, with two 20 watt heads and battery capacity for minimum 2 hours run time.

2.8. INSULATION

1. Generator Exhaust Pipe, Silencer: Provide 50 mm (2") thick high temperature (650 deg C) insulation complete with vapour barrier or 25 mm (1") thick insulation blanket equal to TEMP-MAT SS. Silencer to be critical grade with max ΔP = 8” WC.

2. Supply and install 25 mm (1") thick prefabricated high temperature insulation blanket (650 deg C) on manifold and turbocharger (equivalent to Temp-Mat).

2.9. EXHAUST SYSTEM

1. Air intake filter, dry replaceable element type located close to inlet manifold.

2. Open mesh safety guard(s) around engine exhaust manifold(s), where required for operator protection.

3. Open mesh safety guard supported from exhaust pipe flange to shield connector for operator's protection.

4. Heavy duty, critical type, horizontally mounted exhaust silencer with condensate ANSI Flanges and drain cock complete with 19 mm (3/4") Schedule 40 drain pipe down to 150 mm (6") above floor.

5. Size silencer so that back pressure on engine at 100% load will not exceed engine maker's recommendation, assuming 13.7 m (45 ft.) of equivalent length of exhaust pipe.

6. Silencer to be located within enclosure.

7. The manufacturer shall supply its recommended stainless steel, flexible connector to couple the engine exhaust manifold to the exhaust system.

8. Expansion joints: stainless steel, corrugated, of suitable length, to absorb both vertical and horizontal expansion.

9. Exhaust stack: all welded with supports and expansion compensators as required.

2.10. FUEL SYSTEM

1. Natural Gas.

2. Connection to generator to be with flexible gas line.

3. Off-site natural gas.

   Where the emergency generator is supplied by an off-site utility natural gas supply, the following conditions shall be met:

1. the piping serving the emergency generator or combination of emergency generators shall

    1. be independent of any other natural gas supply to the building;

    2. be protected in accordance with Clause 7.3.9.2 of CSA B149

    3. have a manual valve identified by a permanent sign located at the point of entry of the piping system to the building and accessible only to authorized personnel; and

    4. have a position-indicating contact that will initiate a trouble alarm condition at the generator control panel when the valve is closed as indicated in CSA B149, Table 1. Testing shall be done in accordance with CSA B149, Table 5;

2. that any and all valves installed in the emergency gas supply line between the standardized pressure regulator station and the generator set fuel line connection shall "have a position-indicating contact" that will initiate a trouble alarm condition at the generator control panel; and

3. the natural gas supply to the generator shall be arranged in such a manner that the natural gas supply serving other appliances can be shut off without interrupting the supply to the emergency generator.

2.11. COOLING AIR SYSTEM

1. Engine ventilating system:

    1. air discharge and intake with weatherproof louvers,

    2. modulating thermostat,

    3. replaceable air intake filters.

2.12. EQUIPMENT IDENTIFICATION

1. Provide equipment identification in accordance with Section 16010 – General Electrical Requirements.

2. Control panel:

    1. size 4 nameplates for controls such as alternator breakers and program selector switch,

    2. size 3 nameplates for meters, alarms, indicating lights and minor controls.

3. Safety and warning label(s) on panel door, red labels with approximately 13 mm white letters, e.g. "DANGER 208 VOLTS - THIS AUTOMATIC SET CAN START ANY TIME-ISOLATE ALL SUPPLIES BEFORE ENTERING”

2.13. FABRICATION

1. Shop assemble generating unit including:
    1. 18” H base
    2. engine and radiator
    3. alternator
    4. control panel
    5. battery and charger
    6. outdoor enclosure

2.14. ACCESSORIES, TOOLS AND SPARES

1. Maintenance and operation instruction sheet, mounted on steel backplate with glass front or clear varnish protection, suitable for mounting on side of control panel.

2.15. PANEL ACCESSORIES

1. Terminal blocks, tubular screw type with barriers and labels, Buchanan, Weid-muller, Phoenix, or approved equal by others.
2. Control fuses: in barrier type mounts ground connections lug.
3. Schematic wiring diagram: varnish protected and suitably secured inside door.

2.16. MANUFACTURER

1. This system shall be supplied by an emergency generator manufacturer who has been regularly engaged in the production of engine-alternator sets, automatic transfer switches, and associated controls for a minimum of ten years, thereby identifying one source of supply and responsibility.
2. The manufacturer shall have printed literature and brochures describing the standard series specified, not a one of a kind fabrication.

2.17. ACCEPTABLE MANUFACTURERS

1. Acceptable Manufacturers:
    1. Generac
    2. Kohler

3. Cummins

4. Blue Star

5. Sommers

2. Generator supplier shall have an in-place support facility within 200 kilometres of the site with technical staff, spare parts inventory and all necessary test and diagnostic equipment.

PART 3 - EXECUTION

3.1. PREPARATION

1. Protection

    1. Protect equipment against corrosion, dampness, heavy rain, etc. Also provide adequate protection against damage or loss of components from time equipment leaves manufacturer's factory until received at destination.

    2. Include heavy duty plastic sheet or bags to cover components vulnerable to construction dust. Tag this protective covering to direct that it be left in place (where practical) until construction and clean-up is complete.

    3. Provide in each manual, a complete inventory of all spare parts, tools and accessories, a copy to accompany the shipment and a copy forwarded to CFB Representative.

    4. Ship equipment to Project Site. Arrange shipment to facilitate off-loading by Contractor's crane or skids at Project Site.

2. Preparation - Wiring

    1. Provide heat and oil resistant wire from safety switches and control devices. Run wire neatly in a harness, secure to engine and terminate at engine terminal box.

    2. Provide engine terminal box, CSA enclosure type 5, with numbered terminal strip to correspond with schematic diagram. Provide similar separate junction box for 120V circuits, i.e. exchanger solenoid valve, block heater etc.

    3. Power wiring shall not be less than #12 AWG type RW90 or equal. Control wire shall not be less than #14 AWG type RW90 or other acceptable manufacturer (except within assemblies).

    4. Provide wire markers using printed wire sleeves corresponding with schematic diagram wire numbering. Mfr: W.H. Brady sleeve markers or other acceptable manufacturer (except sub-assemblies).

    5. Adequately support wiring, run neatly, and protect from mechanical damage by grommets and shields. Wiring form between frame and hinged door to be vertical torsion- type over hinge side.

3.2. INSTALLATION

1. Install equipment complete in accordance with engine-generator equipment manufacturer's recommended methods of installation and operation, and in compliance with standards of Regulatory Authorities having jurisdiction.

2. Locate generating unit and install as indicated.

3. Install gas supply system as indicated.

4. Complete wiring and interconnections as indicated.

5. Start generating set and test to ensure correct performance of components.

6. Provide remote indication of safety conditions.

3.3. GROUNDING / BONDING

1. Provide grounding of generator to two (2) local 3m long copper ground bars where generator is in a permanent location. Bonding of ground bars to be extended to automatic transfer switch and electrical service in building using minimum #1AWG copper wire.

2. Bond generator frame and enclosure to building / perimeter ground system, to satisfaction of local Electrical Safety Authority inspector and the Ontario Electrical Safety Code.

3.4. COMMISSIONING

1. General: Upon completion of installation of emergency power supply system, installation shall be tested to ensure conformity to requirements of this Specification.

2. With engine in a "cold start" condition and emergency load at its normal operating level, a power failure shall be simulated by opening all switches or breakers that supply normal power to building or facility. Test load shall be that load which is normally served by emergency power system.

3. Operational test shall be continued for 1 h, after which normal power shall be restored to building or facility and satisfactory transfer of load and shutdown of emergency generating set shall be demonstrated.

    1. Following shall be observed and recorded:

        1. Time delay on start;

        2. Cranking time until the engine starts and runs;

        3. Time required to come up to operating speed;

        4. Time required for each life safety equipment transfer switch to be transferred to the emergency position;

5. Time required to achieve a steady-state condition with all switches transferred to emergency position;

6. The time delay for the connection of any loads arranged to be connected to the emergency supply later than the life safety equipment.

7. Voltage, frequency, and amperes at start-up and at any observed change in load and at maximum site design load;

8. Engine oil pressure, water temperature where applicable, and battery charge rate one minute after start, at 5 min. intervals for first 15 min. and at 15 min. intervals thereafter;

9. Time delay on retransfer for each transfer switch; and

10. Time delay on engine cool-down and shutdown.

4. Load Test: Generator set shall be subjected to a 4 h 100% load test.

1. Building load may serve as part or all of test load if it is continuous, supplemented by a load bank if required. Full load shall equal nameplate kW rating of emergency generator set less applicable derating factors for site conditions. A unity power factor is acceptable for onsite testing, provided that rated load tests at rated power factor have been performed by manufacturer of the emergency generator set prior to shipment.

2. Record all data every 15 min.

5. Cycle Crank Test

1. Cranking cycle as specified in 2.2.9.2 shall be observed and recorded.

2. Crank cycle shall be repeated a second time to demonstrate that batteries have sufficient capacity for a total cranking time of 60 seconds.

3. Time required to recharge batteries shall the requirement of 2.2.9.7.

6. Safety Shutdown and Alarms: Emergency supply shall be tested as recommended by manufacturer to ensure that all safety shutdowns and alarms respond as specified.

7. Ventilation: During tests, demonstrate that ventilating system can keep the room temperature from exceeding 38°C.

8. Receive parts, books, manuals, drawings and any spare parts or tools supplied with standby generator plant and handover such items to Engineer at completion and acceptance of installation.

3.5. TRAINING

1. Provide training for maintenance staff on operation and maintenance of emergency generator system.

2. Allow for two 4 hour on-site classroom type training sessions.

END OF SECTION 26 32 14

PART 1 - GENERAL

1.1. GENERAL

1. Division 1, General Requirements is part of this Section and shall apply as if repeated here.

1.2. SECTION INCLUDES

1. Materials and installation for automatic load transfer equipment which can monitor voltage on all phases of normal power supply, initiate cranking of standby generator unit, transfer loads and shut down standby unit.

1.3. REFERENCES

1. Conform to the requirements of CSA C22.2 No. 178**.**

2. UL1008 - Standard for Safety - Transfer Switch Equipment

1.4. DESIGN CRITERIA

1. Automatic load transfer equipment to:

    1. Monitor voltage on phases of normal power supply

    2. Initiate cranking of standby generator units on normal power failure or abnormal voltage on any one phase below preset adjustable limits for adjustable period of time.

    3. Transfer load from normal supply to standby unit when standby unit reaches rated speed and voltage

    4. Transfer load from standby unit to normal power supply when normal power restored, confirm by sensing of voltage on phases above adjustable pre-set limit for adjustable time period.

    5. Shut down standby unit after running unloaded to cool down using adjustable time delay relay.

    6. Permit manual bypass isolation of the transfer switch to either the normal or emergency power source without interrupting the load.

1.5. SHOP DRAWINGS

1. Submit shop drawings in accordance with Division 1.

1. Make, model and type.
2. Load classification:
    1. Computer loads
    2. Motor loads
    3. Ballast lamp loads
3. Single line diagram showing controls and relays.
4. Description of equipment operation including:
    1. Automatic starting and transfer to standby unit and back to normal power.
    2. Test control
    3. Manual control
    4. Automatic shutdown

1.6. OPERATION AND MAINTENANCE DATA

1. Provide operation and maintenance data for automatic load transfer equipment for incorporation into manuals.
2. Detailed instructions to permit effective operation, maintenance and repair.
3. Technical data:
    1. Schematic diagram of components, controls and relays
    2. Illustrated parts lists with parts catalogue numbers
    3. Certified copy of factory test results.

1.7. SOURCE QUALITY CONTROL

1. Complete equipment, including transfer mechanism, controls, relays and accessories factory assembled and tested in presence of consultant.

PART 2 – PRODUCTS

2.1. MATERIALS

1. UL 1008 / CSA certification

2. Meters: to CAN3-C17-M84

3. Instrument transformers: to CAN3-C13-M83.

2.2. BREAKER OR CONTACTOR BASED TRANSFER EQUIPMENT

1. Rating: as indicated on drawings.

2. WCR: 50,000A at 600V

3. Open Transition

4. Unswitched Neutral

5. In-Phase Transfer Operation

6. Dual Bypass Isolation

7. Bottom Entry for emergency feeds; Top Entry for Normal Power and Load feeds.

8. The automatic transfer switch shall consist of a power transfer module and a control module, interconnected to provide complete automatic operation. Mechanically held and electrically operated by a single solenoid mechanism energized from the source to which the load is to be transferred.

9. Rated for continuous duty and be inherently double throw.

10. Mechanically interlocked to ensure only one of two possible positions – normal or emergency.

11. Control module shall be supplied with a protective cover and be mounted separately from the transfer switch. The interconnecting wiring harness shall include a disconnect plug to disconnect all wires, including both sources of control power. Sensing and control logic shall be solid state and mounted on plug in printed circuit boards. Printed circuit boards shall be keyed to prevent incorrect installation. Interfacing relays shall be industrial control grade plug in type with dust covers.

12. The electrical rating of the bypass isolation switch shall equal or exceed that of the associated automatic transfer switch.

13. The automatic transfer and bypass isolation switch shall be the product of one manufacturer and be completely factory interconnected and tested so that only the service and load connections to the bypass isolation switch are required for field installation.

14. All interconnections between the transfer switch, bypass switch and isolation switch shall be silver plated copper bus bar. A visual position indicator shall be provided to indicate bypass isolation switch position, and availability of normal and emergency sources. A prominent and detailed instruction plate shall be furnished.

15. The control panel shall meet or exceed the voltage surge withstand capability in accordance

with IEEE Standard 472-1974 IANSI C37.90a-1974).

16. All components shall be designed for continuous duty and repetitive load.

17. The entire assembly shall be installed in indoor NEMA Type 1 enclosure.

2.3. OPERATION

1. The automatic transfer switch control panel shall utilize solid state sensing on normal and emergency for automatic, positive operation. The following shall be provided:

    1. All phases of the normal supply shall be monitored line-to-line. Close differential voltage sensing shall be provided on all phases.

    2. The generator set shall be started when the normal supply at the transfer switch on one or more phases has been interrupted or is at a voltage that is less than 90% of the nominal system voltage for 2 sec.

2. A time delay on retransfer to normal source. The time delay shall be automatically bypassed if the emergency source fails and normal source is available. The time delay shall be field adjustable from 0.5 to 30 minutes and factory set at 5 minutes.

3. An unloaded running time delay for emergency generator cool-down. The time delay shall be field adjustable from 0 to 5 minutes and factory set at 5 minutes.

4. A time delay on transfer to emergency. Initially set at 0 but field adjustable up to 2 minutes for controlled timing on load transfer to emergency, where indicated.

5. Independent single phase, voltage and frequency sensing of the emergency source. The pickup voltage shall be adjustable from 85% to 100% of nominal. Pickup frequency shall be adjustable from 90% to 100% of nominal. Transfer to emergency upon normal source failure when emergency source voltage is 90% or more of nominal and frequency is 95% or more of nominal.

6. A contact that closes when normal source fails for initiating engine starting, rated 10 A, 32 VDC. Contacts to be gold plated for low voltage service.

2.4. ACCESSORIES

1. A green signal light to indicate when the automatic transfer switch is connected to the normal source. A red signal light to indicate when the automatic transfer switch is connected to the emergency source.

2. One auxiliary contact that is closed when automatic transfer switch is connected to normal and one auxiliary contact that is closed when automatic transfer switch is connected to emergency. Rated 10 A, 600 volts, 60 Hz AC.

3. A test switch to simulate normal source failure.

4. Auxiliary relay to provide 1 NO and 1 NC contacts for remote alarms and connections to elevator controller and related systems.

5. Visual indication at control panel and remote audible annunciation if automatic transfer switch is not in automatic mode.

6. Visual indication at control panel and remote audible annunciation if automatic transfer switch is in bypass mode.

7. Transfer switch shall have means for safe, manual mechanical operation.

8. In phase monitor adjusted to signal the transfer switch to operate when the incoming power source is within ten electrical degrees of the connected power source.

9. Transfer control center microprocessor to detail information on:

- system status
- power source parameters
- voltage, frequency, time delay and settings
- optional settings – historical even lag, system diagnostic

2.5. EQUIPMENT IDENTIFICATION

1. Provide equipment identification in accordance with Section 26 05 00 – Common Work Results - Electrical.

2. Control panel:

    1. for selector switch and manual switch: size 4 nameplates

    2. for meters, indicating lights, minor controls: size 2 nameplates

2.6. FABRICATION

1. Shop assemble transfer equipment including:

    1. Mounting base and enclosure.

    2. Transfer switch and operating mechanism.

    3. Control transformers and relays.

    4. Accessories.

    5. Manual bypass switch.

2.7. STANDARD OF ACCEPTANCE

1. GE

2. ASCO
3. Eaton
4. Cummins
5. or approved equivalent

PART 3 – EXECUTION

3.1. INSTALLATION

1. Locate, install and connect transfer equipment as indicated.
2. Provide 100mm concrete housekeeping pad under floor standing equipment.
3. Check relays and solid state monitors and adjust as required.
4. Install and connect battery and remote alarms as indicated.
5. Provide all required controls and connections between automatic transfer switch and emergency generator.
6. Provide all required connections to elevator controller and related systems.

3.2. TESTS

1. Perform tests and verify equipment operation at the time of the engine generator set start up.
2. Energize transfer equipment from normal power supply.
3. Set selector switch in “Test” position to ensure proper standby start, running, transfer, retransfer. Return selector switch to “Auto” position to ensure standby shuts down.
4. Set selector switch in “Manual” position and check to ensure proper performance.
5. Set selector switch in “Engine start” position and check to ensure proper performance. Return switch to “Auto” to stop engine.
6. Set selector switch in “Auto” position and open normal power supply disconnect. Standby should start, come up to rated voltage and frequency, and then load should transfer to standby. Allow to operate for 10 min., then close main power supply disconnect. Load should transfer back to normal power supply and standby should shutdown.
7. Repeat, at 1 h intervals, 4 times. Complete test with selector switch in each position, for each test.

END OF SECTION 26 36 23