



TOWNSHIP OF MINDEN HILLS
S.G. NESBITT MEMORIAL EXPANSION
CONCESSION STAND

Project No.	1821
Date:	September 29, 2022
Issued:	TENDER

PART 1 - THE CONSULTANTS

1.1 THE CONSULTANT

- .1 Parkin Architects Limited
1 Valleybrook Drive
Toronto, Ontario M3B 2S7

Telephone: (416) 467-8000
Fax No.: (416) 467-8001

1.2 MECHANICAL AND ELECTRICAL CONSULTANT

- .1 Goodkey, Weedmark & Associates Ltd. (GWAL)
1688 Woodward Drive
Ottawa, Ontario, K2C 3R8

Telephone: (613) 727-5111

1.3 HARDWARE CONSULTANT

- .1 Allegion Canada Inc.
1076 Lakeshore Road East
Mississauga, ON, L5E 1E4

Telephone: (647) 376-6610

END OF DOCUMENT

DOCUMENT/SECTION NAME

CONSULTANT

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

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CONSULTANT

DIVISION 31 – EARTHWORK – NOT USED

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CONSULTANTS

CONSULTANT NAME	DISCIPLINE	ABBREVIATION
Parkin Architects Ltd.	ARCHITECTURAL	ARCH
Goodkey, Weedmark & Associates Ltd. (GWAL)	MECHANICAL	MECH
Goodkey, Weedmark & Associates Ltd. (GWAL)	ELECTRICAL	ELEC
Allegion Canada Inc.	HARDWARE	HARD

LEGEND

* - Specifications prepared by Consultants other than Parkin Architects Limited have been prefixed with an asterisk. These specifications are not included under, nor governed by, Parkin Architects Limited's seal

END OF DOCUMENT

PART 1 - GENERAL

1.1 ARCHITECTURAL DRAWINGS

- .1 Architectural Drawings forming part of the Contract Documents are those listed on Drawing No. 1821-A-101 dated "September 29, 2022" with the following statement in the revision column:
 - .1 "ISSUED FOR TENDER – SEPTEMBER 29, 2022".

1.2 ELECTRICAL DRAWINGS*

- .1 Electrical Drawings forming part of the Contract Documents are those listed on Drawing No. E1 dated "September 29, 2022" sheet numbers beginning with the prefix "E" with the following statement in the revision column:
 - .1 "ISSUED FOR TENDER – SEPTEMBER 29, 2022"

1.3 MECHANICAL DRAWINGS.

- .1 Mechanical Drawings forming part of the Contract Documents are those listed on Drawing No. M1 dated "September 29, 2022" sheet numbers beginning with the prefix "M" with the following statement in the revision column:
 - .1 "ISSUED FOR TENDER – SEPTEMBER 29, 2022"

LEGEND

** - Drawings prepared by Consultants other than Parkin Architects Limited have been prefixed by asterisks and are not included under, nor governed by, Parkin Architects Limited's seal.*

END OF DOCUMENT

PART 1 - GENERAL

1.1 BIDDER

- .1 From (Name of Bidder): _____
- .2 Address: _____
- .3 Telephone: _____
- .4 Fax: _____

1.2 BASE BID PRICE

- .1 I/We the undersigned, having carefully examined the Bid Documents and having received, carefully examined and incorporated

Addenda No. _____ to No. _____

inclusive, having visited and investigated the *Place of the Work*, and having examined all conditions, circumstances and limitations affecting the *Work*, offer to enter into a *Contract* with the *Owner* to perform the *Work* required by the Bid Documents for the price of

\$ _____. The price offered excludes the Harmonized Sales Tax (HST) but includes all other eligible taxes.

1.3 CASH ALLOWANCES

- .1 I/We hereby state the Base Bid Price stated herein includes Cash Allowance amount identified in Section 01 20 00 which will be expended under the terms and conditions of the *Contract*.

1.4 BID SECURITY

- .1 Attached to this bid is a bid bond as required by the Bid Documents. No other form of bid security is acceptable.

1.5 PERFORMANCE BOND

- .1 I/We agree to provide a Performance Bond as required by the Bid Documents.

1.6 LABOUR & MATERIAL PAYMENT BOND

- .1 I/We agree to provide a Labour & Material Payment Bond as required by the Bid Documents.

1.7 AGREEMENT TO BOND

- .1 I/We attach to this bid a Consent of Surety for undertaking to provide the bonds required by the Bid Documents.

1.8 LIST OF SUBCONTRACTORS

.1 Name and Bid Price, (HST excluded), of Mechanical *Subcontractor* included in Base Bid Price for the *Work* is:

.1 Mechanical *Subcontractor*: _____
\$ _____

.2 Name and Bid Price, (HST excluded), of Electrical *Subcontractor* included in Base Bid Price for the *Work* is:

.1 Electrical *Subcontractor*: _____
\$ _____

1.9 SCHEDULE

.1 I/We the undersigned declare that:

.1 I/We agree to perform the *Work*, inclusive of mobilization time, in compliance with the *Contract Documents* and attain *Substantial Performance* of the *Work* within _____ weeks after award of the *Contract*;

1.10 DECLARATIONS

- .1 no person, firm or corporation other than the undersigned has any interest in this bid or in the proposed *Contract* for which this bid is made; and
- .2 this bid is irrevocable and is open for acceptance by the Owner for the period specified in Document 00 21 13 Instructions to Bidders from the date of submission.

1.11 ADDRESS, LEGAL STATUS AND SIGNATURE OF BIDDER

- .1 We hereby designate the address, given below as the legal address to which all notices, directions or other communications may be served or mailed:

Street _____

City _____ Province _____

Postal Code _____ Email: _____

- .2 We hereby declare that the Bidder has legal status stated below:

Individual _____ Partnership _____

Corporation incorporated under the laws of
_____ Date _____

- .3 This Base Bid Form is submitted under seal in the name:

(Company Name - Typed)

By _____
(Signature)

Name _____
(Typed)

Title _____

Signed and sealed this _____ day of _____, 201__.

END OF DOCUMENT

PART 1 - GENERAL

1.1 PROJECT DESCRIPTION

- .1 S.G. Nesbitt Memorial Arena Expansion
55 Parkside Street
Minden Hills, Ontario K0M 2K0
Concession Stand

1.2 WARRANTY

- .1 Township of Minden Hills - S.G. Nesbitt Memorial Arena Expansion
55 Parkside Street
Minden Hills, Ontario K0M 2K0
- .2 Date: _____
- .3 Section Number and Title: _____
- .4 Company's Name: _____ (Ltd/Inc. or any assignee or successor's title)
- .5 Address: _____

1.3 DEFINITION

- .1 Give a clear description of *The Work* under this Warranty and the remedial action to be taken under the Warranty, complying with requirements specified under respective Sections of the *Specifications*.

1.4 WARRANTY JOINTLY AND SEVERALLY

- .1 Contractor and *Subcontractor* for valuable consideration jointly and severally warrant all Work defined above is free from any defect or deficiency in quality of work and materials. Without limiting generality of foregoing, _____ **[State particulars of each warranty here and generally as specified]** _____ for Warranty Period herein set out, and in consideration as aforesaid *Contractor* and *Subcontractor* jointly and severally covenant to remedy any defect or deficiency due to faulty materials or workmanship appearing within Warranty Period according to notice in writing received from the *Owner*, or their duly authorized agents.

1.5 WARRANTY PERIOD

- .1 Commences from date described under Article [“GC WARRANTY”] of the General Conditions of the *Contract*.

Name and Address of *Subcontractor*

Name and Address of *Contractor*

Signature

Signature

Seal

Seal

END OF DOCUMENT

SPECIMEN

PART 1 - GENERAL

1.1 SUPPLIER

.1 *Supplier's name and address:*

.2 *Date Product is released to Owner:*

1.2 SECTION NO: _____

.1 *Product being released to the Owner:*

.2 *Quantity of Product used for extent of the Work:*

.3 *Quantity of Product released to the Owner:*

1.3 SIGNATURE

.1 Confirmation that Extra Materials were delivered to *Owner* in accordance with requirements of the *Contract Documents*.

Owner's Signature

Owner's Name

Name typed

Date

END OF DOCUMENT

The Definitions which forms part of Standard Construction Document - CCDC 2 - 2008 are hereby amended as follows:

1.1 DEFINITIONS

- .1 Delete following definition in its entirety and substitute new definition:

“4. Consultant

The *Consultant* is the person or entity identified as such in the Agreement. The *Consultant* is Parkin Architects Limited. The term *Consultant* means the *Consultant* or the *Consultant's* authorized representative. For greater certainty, refer to Document 00 01 05, List of *Consultants* for other *Consultants* involved in respective disciplines.”

- .2 Add new definitions:

27. Day

Day means a calendar *Day*.

28. Cash Allowance Disbursement Authorization (CADA)

A *Cash Allowance Disbursement Authorization* is an authorization to the *Contractor* to expend monies from Cash Allowances included in the *Contract Price*.

29. Supply

Supply means completion of the following activities, including the associated labour, services, plant, construction machinery and equipment required to:

- .1 fabricate or purchase *Products*,
- .2 deliver *Products* to the *Place of The Work*,
- .3 unload *Products*, and
- .4 store *Products* in accordance with manufacturers' instructions.

30. Install

Install means completion of the following activities, including the associated labour, services, plant, construction machinery and equipment required to:

- .1 Remove *Products* from storage and locate for placement,
- .2 Position and adjust *Products* for final placement,
- .3 Affix and anchor *Products* in final placement, in accordance with manufacturers' instructions and *Contract Documents*,
- .4 Commission and adjust *Products* for proper operation.

31. Make Good (Made Good)

Make Good or *Made Good* means repairing, restoring, refurbishing, rehabilitating, or performing filling operation on any existing components disturbed due to work of the Contract, to at least the condition existing at the commencement of *The Work*, in terms of construction integrity, finishes, alignment with existing adjoining surfaces, compatibility of materials, sound attenuation criteria, exfiltration/infiltration requirements, air/vapour barrier and thermal continuity.

32. As-Built Drawings (As-Builts)

As-Built Drawings or *As-Builts* means a set of *Contract Documents* marked up by the *Contractor* during construction, to record changes to the original *Contract Documents* and to illustrate actual locations of the building components (including hidden utilities or concealed elements).

33. Mock-up

Mock-up means 2 or more materials, *Products*, or systems specified to be constructed for the *Project* on site, off-site or at the shop as applicable, and then constructed on site to encourage a *Contractor*, *Subcontractor* and/or related *Suppliers* to be aware of the integral interfaces required to assemble these components or systems.

34. Record Documents

Record Documents means a compendium of *Contract Documents* edited to reflect site changes and other information shown on the *As-Built Drawings* and/or known to the *Consultant*.

35. In-Service Date

In-Service Date means a date when a phase of *The Work* meets OBC requirements for occupancy, an Occupancy Permit in accordance with Division C, Part 1, 1.3.3 – Occupancy of Unfinished Building” has been submitted, and *Consultant* approves the phase is complete and deemed ready for occupancy.

36. Overhead

Overhead means ongoing and operating expenses related to *The Work* including but not limited to:

- .1 *Project*-related operating expenses associated with the following:
 - .1 salaries, wages, benefits for personnel including but not limited to:
 - .1 staff, general managers, warehouse personnel, maintenance workers timekeepers, accountants and clerks, estimators, shop stewards, draft-persons/CAD operators, and other employees engaged in daily operations of the business;
 - .2 general office expenses including but not limited to:
 - .1 rent, leases, mortgages, financing costs (including holdback), bonding and insurance;
 - .2 utilities, phone, fax, printing, courier charges and/or office equipment rentals;
 - .3 lodging and travel,
 - .4 leased or rented equipment, furniture and facilities not used on the *Project* site;
 - .5 permits and/or licences required by authorities having jurisdiction for conducting business in a jurisdiction (except where these are special for particular items or work);
 - .6 shipping, haulage and hoisting, and
 - .7 disposal charges and related services.
- .2 *Project*-related site expenses associated with the following:
 - .1 salaries, wages, benefits for personnel directly employed on *The Work* including but not limited to:

- .1 *Project* managers, superintendents, mechanical and electrical coordinators, foremen, engineers, timekeepers, accountants, clerks, watch persons and other personnel directly employed on the *Project*;
- .2 non-productive labour such as breaks (washroom, lunch or otherwise);
- .3 site/trailer/temporary office, sheds or other general temporary site support facilities (e.g. *Project* signage, site cleaning, temporary sanitary facilities etc.)
- .4 temporary utilities associated temporary facilities including but not limited to: water, power, heat, telephone, and data.
- .5 snow removal and similar activities,
- .6 equipment rentals and small tools,
- .7 activities, personnel and equipment associated with *Project* safety including but not limited to:
 - .1 site security and fire prevention, hoarding, temporary protection of areas adjacent to *The Work*, signage, bump lines, etc.;
- .8 activities associated with coordination with other *Contractors* and trades (surveying, interferences, site measurements etc.), and coordination with *Owner* (service disruptions, move-in notifications etc.);
- .9 closeout requirements including but not limited to: *As-Built Drawings* (electronic and/or hardcopies), operation and maintenance (O&M) manuals and similar documentation.

Refer to Document 00 73 10, Supplementary Conditions, Part 6: Changes in *The Work*, GC 6.1 for additional requirements.

END OF DOCUMENT

The Standard Construction Document for Stipulated Price *Contract* (CCDC 2 - 2008), English version, consisting of the Agreement Between *Owner* and *Contractor*, Definitions and General Conditions of the Stipulated Price *Contract*, Parts 1 to 12 inclusive and additional Part 13, governing same is hereby made part of these *Contract Documents*, with the following amendments and modifications:

GENERAL PROVISIONS

GENERAL

- .1 Where a General Condition or paragraph of the General Conditions of the Stipulated Price *Contract* is deleted by these Supplementary Conditions, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, and the numbering of the deleted item will be retained, unused.

GC 1.1 CONTRACT DOCUMENTS

- .1 Delete paragraph 1.1.6 and replace with:
 - "1.1.6 Neither the organization of the *Specifications* nor the arrangement of *Drawings* shall control the *Contractor* in dividing the work among *Subcontractors* and *Suppliers*. 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 *Consultant* to settle disputes among the *Subcontractors* and *Suppliers*."
- .2 To paragraph 1.1.7, add new subparagraph 1.1.7.5:
 - "1.1.7.5 In case of discrepancies, noted materials and annotations shall take precedence over graphic indications in the *Contract Documents*."
- .3 Delete paragraph 1.1.8 and substitute:
 - "1.1.8 The Owner shall provide the *Contractor*, without charge, 10 copies of the *Contract Documents*. Additional copies may be purchased from the *Consultant* at cost plus 10%."
- .4 Add new paragraph 1.1.11:
 - "1.1.11 Syntax
 - .1 Where the words 'accepted', 'reviewed', 'designated' 'directed', 'inspected', 'instructed', 'permitted', 'required', and 'selected' are used in Standards or in the *Contract Documents*, they are deemed to be followed by the words 'by the *Consultant*', unless the context provides otherwise.
 - .2 Where the words 'acceptable', 'submit' and 'satisfactory' are used in Standards or in the *Contract Documents*, they are deemed to be followed by the words 'to the *Consultant*', unless the context provides otherwise.
 - .3 Where the masculine is used in the *Contract Documents*, it shall be read and interpreted as if the feminine or neuter had been used when the context of the statement so requires, and the rest of the sentence, clause, paragraph or item shall be interpreted as if all changes in grammar, gender or terminology thereby rendered necessary had been made."

PART 2 - ADMINISTRATION OF THE CONTRACT

GC 2.4 DEFECTIVE WORK

- .1 To paragraph 2.4.1 add new subparagraphs:
 - “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*.
 - 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 operation of the *Owner*.”

PART 3 - EXECUTION OF THE WORK

GC 3.1 CONTROL OF THE WORK

- .1 Add new paragraphs 3.1.3 and 3.1.4 as follows:
 - “3.1.3 The *Contractor* is the sole arbiter and coordinator of the *Contract* and neither the organization of the *Specifications* into divisions, sections and parts, nor the arrangement of the *Drawings* shall oblige the *Consultant*, or the *Owner* to act as arbiter to establish limits of responsibility between the *Contractor* and its *Subcontractors*.
 - 3.1.4 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 proceeding with any part of the affected work.”

GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

- .1 Delete subparagraph 3.2.2.1 and substitute:
 - “3.2.2.1 Intentionally left blank.”
- .2 Delete subparagraph 3.2.2.2 in its entirety and substitute:
 - “3.2.2.2 Intentionally left blank.”
- .3 To paragraph 3.2.3 add new subparagraph:
 - “3.2.3.4 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 the *Place of the Work*, including all of the responsibilities of the “constructor” under the Occupational Health and Safety Act.”
- .4 Add new paragraphs 3.2.7 and 3.2.8 as follows:
 - “3.2.7 Entry onto the *Work* by the *Owner’s* forces or by other contractors does not constitute acceptance of the *Work* and does not relieve the *Contractor* of responsibility to complete the *Work*.

- 3.2.8 Work by others, including the *Owner*, which may include attachment to, installation upon, or connection of other work to the *Work* of the *Contractor* does not relieve the *Contractor* of its responsibility to provide and maintain the specified warranties except where damage is caused by the *Owner's* forces or by other contractors.”

GC 3.4 DOCUMENT REVIEW

- .1 Delete paragraph 3.4.1 and substitute:

“3.4.1 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 comply with the standard of care described in **ADDITIONAL GENERAL CONDITIONS, GC 3.14 PERFORMANCE BY CONTRACTOR**, paragraph 3.14.1 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*. 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. If the *Contractor* does discover any error, inconsistency or omission in the *Contract Documents*, the *Contractor* shall not proceed with the work affected until the *Contractor* has received corrected or missing information from the *Consultant*.”

- .2 Add new paragraph 3.4.2 as follows:

“3.4.2 If the *Contractor* finds discrepancies in and/or omissions from, the *Contract Documents* or has any doubt as to the meaning or intent of any part thereof, the *Contractor* must immediately notify the *Consultant*, who will provide written instructions or explanations. Neither the *Owner*, nor the *Consultant* will be responsible for oral instructions.”

GC 3.5 CONSTRUCTION SCHEDULE

- .1 Delete paragraph 3.5.1 and substitute:

“3.5.1 The *Contractor* shall:

3.5.1.1 Prior to submitting the first application for payment, submit to the *Owner* and the *Consultant* for their review and acceptance a construction schedule indicating the critical path for the *Project* demonstrating that the *Work* will be performed in conformity with the *Contract Time* and in accordance with the *Contract Documents*. The *Contractor* shall provide the schedule information required by this paragraph 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;

3.5.1.2 Provide the expertise and resources, such resources including manpower and equipment, as are necessary to maintain progress under the accepted baseline construction schedule referred to in paragraph 3.5.1.1 or any successor or revised schedule accepted by the *Owner* pursuant to GC3.5;

3.5.1.3 Monitor the progress of the *Work* on a weekly basis relative to the construction schedule reviewed and accepted pursuant to paragraph 3.5.1.1, or any successor or revised schedule accepted by the *Owner* pursuant to GC 3.5, update the schedule on a monthly basis and advise the *Consultant* and the

Owner in writing of any variation from the baseline or slippage in the schedule; and

3.5.1.4 If, after applying the expertise and resources required under paragraph 3.5.1.2, the *Contractor* forms the opinion that the slippage in schedule reported in paragraph 3.5.1.3 cannot be recovered by the *Contractor*, it shall, in the same notice provided under paragraph 3.5.1.3, indicate to the *Consultant* and the *Owner* if the *Contractor* intends to apply for an extension of *Contract Time* as provided in **PART 6 - CHANGES IN THE WORK.**"

.2 Add new paragraph 3.5.2 as follows:

"3.5.2 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, based on critical path methodology, or if the *Contractor* has given notice of such to the *Owner* or the *Consultant* pursuant to 3.5.1.3, the *Contractor* shall take appropriate steps to cause the actual progress of the *Work* to conform to the schedule and shall produce and present to the *Owner* and the *Consultant* a recovery plan demonstrating how the *Contractor* will achieve the recovery of the schedule. If the *Contractor* intends to apply for a change in the *Contract Price* in relation to a schedule recovery plan, the *Contractor* shall proceed with **PART 6 – CHANGES IN THE WORK.**"

GC 3.6 SUPERVISION

.1 Delete paragraph 3.6.1 and substitute:

"3.6.1 The *Contractor* shall provide all necessary supervision and appoint competent representatives who shall be in attendance at the *Place of the Work* while work is being performed. The appointed representatives shall not be changed except for valid reasons, and upon the *Contractor* obtaining the *Consultant's* written consent, which consent will not be unreasonably withheld."

.2 Add new paragraph 3.6.3 as follows:

"3.6.3 The *Owner* may, at any time during the course of the *Work*, request the replacement of the appointed representative(s), where the grounds for the request involve conduct which jeopardizes the safety of the *Owner's* operations. Immediately upon receipt of the request, the *Contractor* shall make arrangements to appoint an acceptable replacement."

GC 3.7 SUBCONTRACTORS AND SUPPLIERS

.1 Delete paragraph 3.7.2 and substitute:

"3.7.2 The *Contractor* agrees not to change *Subcontractors* without prior written approval of the *Owner*, which approval will not be unreasonably withheld."

GC 3.8 LABOUR AND PRODUCTS

.1 Add new paragraph 3.8.4 as follows:

"3.8.4 The *Contractor* is responsible for the safe on-site storage of *Products* and their protection (including *Products* supplied by the *Owner* and other contractors to be installed under the *Contract*) in such ways as to avoid dangerous conditions or contamination to the *Products* or other persons or property and in locations at the *Place of the Work* to the satisfaction of the *Owner* and the *Consultant*. The

Owner shall provide all relevant information on the *Products* to be supplied by the *Owner*.”

GC 3.9 DOCUMENTS AT THE SITE

- .1 Delete paragraph 3.9.1 and substitute:

“3.9.1 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 meetings at the *Place of the Work*, in good order and available to the *Owner* and *Consultant*.”

GC 3.10 SHOP DRAWINGS

- .1 Amend the title to read: “SHOP DRAWINGS AND OTHER SUBMITTALS”.

- .2 Add “and *Submittals*” after the words “*Shop Drawings*” in following paragraphs:

3.10.2, 3.10.4, 3.10.7, 3.10.8, 3.10.8.2, 3.10.9, 3.10.10, 3.10.11, and 3.10. 12.

- .3 Delete paragraph 3.10.3 and substitute:

“3.10.3 Prior to the first application for payment, the *Contractor* and the *Consultant* shall jointly prepare a schedule of the dates for submission and return of *Shop Drawings* and any *Submittals*.”

- .4 Delete subparagraph 3.10.8.1 and substitute:

“3.10.8.1 The *Contractor* has determined and correlated the field measurements with the *Shop Drawings* and any *Submittals* and field construction conditions, *Product* requirements, catalogue numbers and similar data, or will do so if not possible at that time, and”

- .5 Delete paragraph 3.10.12 and substitute:

“3.10.12 The *Consultant* will review and return *Shop Drawings* and *Submittals* in accordance with the schedule agreed upon in 3.10.3, or, in the absence of such schedule, with reasonable promptness. If, for any reason, the *Consultant* cannot process them within the agreed-upon schedule or with reasonable promptness, the *Consultant* shall notify the *Contractor* and they shall meet to review and arrive at an acceptable revised schedule for processing. The *Contractor* shall update the *Shop Drawings* and *Submittals* Schedule to correspond to changes in the construction schedule. Changes in the *Contract Price* or *Contract Time* may be made only as otherwise provided in the *Contract*.”

ADDITIONAL GENERAL CONDITIONS

- .1 Add new General Conditions GC 3.14 and GC 3.15 as follows:

“GC 3.14 PERFORMANCE BY CONTRACTOR

- 3.14.1 In performing its services and obligations under the *Contract*, the *Contractor* shall exercise a 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 *Contractor's* obligations, duties and responsibilities shall be interpreted in accordance with this standard. The *Contractor* shall exercise the same standard of due care and diligence in respect of any *Products*, personnel, or procedures which it may recommend to the *Owner*.
- 3.14.2 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 its designated supervisor and project manager, 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 that would have a material effect on the financial ability of the *Contractor* to perform its work under the *Contract*.

GC 3.15 RIGHT OF ENTRY

- 3.15.1 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 uses before *Substantial Performance of the Work*, if, in the opinion of the *Contractor*, such entry or occupation does not prevent or substantially interfere with the *Contractor* in completion of the *Contract* within the *Contract Time*. Such entry or occupation shall not be considered as acceptance of the *Work* or in any way relieve the *Contractor* from responsibility to complete the *Contract*. ”

PART 4 - ALLOWANCES

GC 4.1 CASH ALLOWANCES

- .1 Delete paragraph 4.1.4 and substitute:
- “4.1.4 Where costs under a cash allowance exceed the amount of the allowance, unexpended amounts from other cash allowances will be reallocated at the *Consultant's* direction to cover the shortfall.”
- .1 Delete paragraph 4.1.5 and substitute:
- “4.1.5 The unexpended total cash allowance amount will be deducted from the *Contract Price by Change Order*.”
- .2 Add new paragraph 4.1.8 as follows:

- “4.1.8 The *Owner* reserves the right to call, or to have the *Contractor* call, competitive bids for portions of the *Work*, to be paid for, from cash allowances.”

PART 5 - PAYMENT

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

- .1 Amend the title to read: “GC 5.1 FINANCING INFORMATION REQUIRED”.
- .2 Delete paragraph 5.1.1 and substitute:
- “5.1.1 The *Owner* and *Contractor* shall provide each other with timely *Notice in Writing* of any material change in their financial ability to fulfil their respective obligations under the *Contract*.”
- .3 Delete paragraph 5.1.2 in its entirety.

GC 5.2 APPLICATIONS FOR PROGRESS PAYMENT

- .1 Add new paragraph 5.2.0 to GC 5.2 as follows:
- “5.2.0 The *Contractor* shall submit a draft application for payment to the *Consultant* and *Owner* by email to the project manager, and any other person identified by *Owner* in writing, at least five (5) *Working Days* prior to submission of the *Proper Invoice*. The draft application for payment will be submitted in a format to be mutually agreed upon by the *Owner*, *Consultant* and *Contractor*.”
- .2 Delete paragraph 5.2.1 in its entirety and replace with the following:
- “5.2.1 As the *Work* progresses, the *Contractor* shall submit to the *Consultant* and *Owner* by email to the project manager, and any other person identified by *Owner* in writing, copies of the *Proper Invoice* on account as provided in Article A-5 of the *Agreement*. The *Proper Invoice* so submitted shall incorporate any changes as requested by the *Owner* prior to the *Proper Invoice* submission date.”
- .3 Delete paragraph 5.2.2 and replace with the following:
- “5.2.2 A “***Proper Invoice***” shall mean an application for payment that includes each of the following:
- The *Contractor*’s name and address;
 - The date of the *Proper Invoice*;
 - The period during which the subject work, services, products or materials were supplied;
 - Identification of this *Contract* and any applicable *Change Order* or *Change Directive* (being the authority under which the work, services, products or materials were supplied);
 - A description of the work, services, products or materials supplied (including quantity where appropriate);

- The amount payable for the work, services, products or materials supplied and the payment terms;
- The name, title, telephone number and mailing address of the person to whom payment is to be sent;
- A statement based on the schedule of values submitted pursuant to paragraph 5.2.4;
- Disclosure of the GST/HST applicable to the amounts claimed in accordance with the requirements of the *Excise Tax Act* (Canada), as required by GC 10.1;
- The GST/HST registration number of the *Contractor* together with all of the other details required by the *Excise Tax Act* (Canada), as required by GC 10.1;
- Where payment is requested for *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work*, evidence as reasonably required by the *Consultant* to establish the value and delivery of such *Products*;
- For each *Proper Invoice* submitted after the first, a statutory declaration using the latest CCDC 9A form of "Statutory Declaration of Progress Payment Distribution by Contractor", declaring that payments in connection with the *Work*, as noted in the Statutory Declaration, have been made as of a date that is no more than 35 calendar days after the date the *Owner* received the *Proper Invoice* for the period immediately preceding that covered by the current *Proper Invoice*; provided that such statutory declaration is to be received by *Owner* within six (6) days of the date of the current *Proper Invoice*;
- Evidence of compliance with worker's compensation/ workplace safety and insurance board legislation applicable to the *Place of the Work*, including payments due thereunder, as required by GC 10.4;
- *Contractor's* calculation of the remaining amount required to complete the *Work*;
- where payment of the holdback or finishing holdback is requested pursuant to GC 5.5 and GC 5.7, a declaration that no written notices of lien have been received by the *Contractor*;
- where final payment is requested pursuant to GC 5.7, all documents required by paragraph 5.7.1; and
- any other supporting documents required by the *Contract Documents*."

.4 Delete paragraph 5.2.3 and replace it with the following:

"5.2.3 The amount claimed in a *Proper Invoice* shall be for the value, proportionate to the amount of the *Contract*, of *Work* performed and *Products* delivered to the *Place of the Work* as of the last day of the payment period. No amount claimed in a *Proper Invoice* shall include *Products* delivered to the *Place of the Work* unless the *Products* are free and clear of all security interest, liens and other claims of third parties."

.5 Amend paragraph 5.2.4 as follows:

(A) Delete the words "at least 15 calendar days before the first application for payment" in the first line and replace with the words "within five (5) Working Days after receiving authorization to proceed with the Work."; and

(B) At the end of paragraph 5.2.4 replace the words "applications for payment" with "Proper Invoices".

.6 Delete paragraph 5.2.6 in its entirety.

.7 Delete paragraph 5.2.7 and replace it with the following:

"5.2.7 Any *Products* delivered to the *Place of the Work* but not yet incorporated into the *Work* shall remain at the risk of the *Contractor* notwithstanding the title has passed to the *Owner* pursuant to GC 13.1 OWNERSHIP OF MATERIALS."

.8 Add new paragraph 5.2.8, 5.2.9, and 5.2.10 as follows:

5.2.8 The *Owner* may, in its sole and absolute discretion, elect to make payment on an application for payment that does not meet the requirements of a *Proper Invoice* set out in paragraph 5.2.2. In no event shall any such election by the *Owner* constitute a waiver of the *Owner's* right to refuse to make payment in respect of any application for payment that does not constitute a *Proper Invoice*.

5.2.9 The *Contractor* shall submit with each application for progress payment an updated construction schedule along with an unconditional written declaration, duly signed by an authorized representative of the *Contractor*, stating that there has been no delay in the progress of the *Work* for which the *Contractor* has any claim against the *Owner* with the exception of any such claim previously disclosed in accordance with the applicable provisions of the *Contract*.

5.2.9 The *Contractor* shall submit, with each application for progress payment after the first, a Statutory Declaration, on an original form of CCDC Document 9A-2001, stating that payments in connection with the *Work*, as noted in the Statutory Declaration, have been made to the end of the period immediately preceding that covered by the current application.

5.2.10 The *Contractor* shall submit a valid Workplace Safety & Insurance Board Clearance Certificate, with each application for progress payment.

5.2.11 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* reserves the right to retain a reasonable amount for the value of the as-built *Drawings* not presented for review.”

5.2.12 The *Contractor* shall cause payment to be made to all *Subcontractors*, trade contractors, workers and *Suppliers* within 7 calendar days after receipt of a progress payment under this *Contract* that embodies payment for their work or materials under the *Proper Invoice* or as otherwise required under the *Construction Act*. *Contractor* acknowledges that an application for progress payment will only be a *Proper Invoice* if *Owner* has received the Statutory Declaration. This paragraph shall not prevent the *Contractor* or any *Subcontractor* from holding back payment on account of deficient work, provided the amount thereof is identified in the Statutory Declaration and is deducted from further amounts due to the *Contractor*”

GC 5.3 PROGRESS PAYMENT

- .1 In paragraph 5.3.1 replace the words “an application for payment” with “a *Proper Invoice*”.
- .2 Delete paragraph 5.3.1.1 in its entirety and replace with the following:
 - “.1 the *Consultant* will promptly notify the *Owner* of any *Proper Invoices* received.”
- .3 In paragraph 5.3.1.2, replace the words Delete from the first line of subparagraph 5.3.1.2, the words, “calendar days” and substitute the words: “*Working Days*”.
- .4 In paragraph 5.3.1.2, add at the end the words:

“and, if applicable, issue a “Notice of Non-Payment” pursuant to the *Construction Act* on behalf of the *Owner*.”
- .5 Delete paragraph 5.3.1.3 in its entirety and replace with the following:
 - “.3 The *Owner* shall make payment to the *Contractor* in respect of a *Proper Invoice* no later than twenty-eight (28) calendar days from the date of receipt or as otherwise required by the *Construction Act*.”
- .6 Add new paragraphs 5.3.2 and 5.3.3 as follows:
 - “5.3.2 If the *Contractor* fails to provide any element of a *Proper Invoice* listed in paragraph 5.2.2, including a statutory declaration or the workers’ compensation clearance certificate, the application for payment will not constitute a *Proper Invoice* and the *Owner* shall not be required to make payment to the *Contractor* until a complete *Proper Invoice*, dated as of the date of submission, is submitted.
 - 5.3.3 The *Contractor* shall have no entitlement to payment and no *Proper Invoice* may be submitted for changes in the *Work* without a written *Change Order* or *Change Directive* issued by the *Owner*.”

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

- .1 Delete paragraph 5.4.3 and substitute:
 - “5.4.3 Immediately following the issuance of the certificate of *Substantial Performance of the Work*, the *Contractor*, in consultation with the *Consultant*, shall establish reasonable dates for finishing the *Work* and correcting deficient work.”

.2 Add new paragraphs 5.4.4 through 5.4.6 as follow:

- “5.4.4 The *Contractor* shall publish, in a construction trade newspaper in the area of the location of the *Work*, a copy of the Certificate of *Substantial Performance of the Work* within seven (7) calendar days of receiving a copy of the Certificate signed by the *Consultant*, and the *Contractor* shall provide suitable evidence of the publication to the *Consultant* and *Owner*. If the *Contractor* fails to publish such notice, the *Owner* shall be at liberty to publish and back charge the *Contractor* its reasonable costs for doing so
- 5.4.5 Prior to submitting its application for *Substantial Performance of the Work*, the *Contractor* shall submit to the *Consultant* all:
- .1 as-built drawings;
 - .2 all required manufacturers’ inspections, certifications, guarantees and warranties as specified in the Contract Documents;
 - .3 all maintenance manuals, operating instructions, maintenance and operating tools, replacement parts or materials as specified in the Contract Documents;
 - .4 certification by all permit-issuing authorities, indicating approval of all permitted installations;
 - .5 certification by all testing, cleaning or inspection authorities or associations as specified in the Contract Documents;
 - .6 certification that the Contractor is in good standing with workers’ compensation or Workplace Safety and Insurance Board legislation at the Place of the Work;
 - .7 statement indicating reconciliation of all Change Orders or claims under the Contract;
 - .8 occupancy permits from the local authority having jurisdiction over the Project;
 - .9 testing and balancing reports, and
 - .10 any 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 accordance with the requirements of all municipal, government and utilities authorities having jurisdiction.
- 5.4.6 Where the *Contractor* is unable to deliver the documents and materials described in paragraph 5.4.5, then, provided that none of the missing documents and materials interferes, in a material way, with the use and occupancy of the *Work*, failure to deliver shall not be grounds for the *Consultant* to refuse to certify *Substantial Performance of the Work*. Any documents or materials not delivered in accordance with paragraph 5.4.5 shall be delivered as provided in GC 5.7 FINAL PAYMENT, paragraph 5.7.1.”

GC 5.5 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF THE WORK

- .1 In paragraph 5.5.1.1 delete the words “an application for payment” and replace them with “a *Proper Invoice*”.
- .2 Delete paragraph 5.5.1.2 in its entirety.
- .3 Delete paragraph 5.5.2 in its entirety and replace it with the following:

“5.5.2 After the receipt of a *Proper Invoice* for payment of the holdback amount from the *Contractor*, including all documents as provided in paragraph 5.2.2, the *Consultant* will issue a certificate for payment of the holdback amount.

.4 Delete paragraph 5.5.3 in its entirety and replace it with the following:

“5.5.3 The *Owner* may refuse to pay some or all of the holdback amount referred to in paragraph 5.5.2, provided that the *Owner* complies with any applicable requirements of the *Construction Act*.”

.5 Delete paragraph 5.5.4 and replace with the following:

“Subject to paragraph 5.5.3, the holdback amount referred to in paragraph 5.5.2 is due and payable on the first calendar day following the date on which all liens that may be claimed against such holdback have expired or been satisfied, discharged or otherwise provided for under the *Construction Act*, provided the certificate of *Substantial Performance of the Work* has been issued in accordance with GC 5.4.”

.6 Delete from paragraph 5.5.2 line 1, “statement” and substitute “ the documents”.

GC 5.6 PROGRESSIVE RELEASE OF HOLDBACK

.1 Delete paragraph 5.6.1.

.2 Delete paragraph 5.6.2 in its entirety.

GC 5.7 FINAL PAYMENT

.1 Delete paragraph 5.7.1 and substitute:

“5.7.1 When the *Contractor* considers that the *Work* is completed, , including that all deficiencies which are identified by the Owner or Consultant have been remedied, the Contractor shall notify the Consultant and Owner in writing. After receipt of a report from the Commissioning Agent verifying that all building systems and other technologies forming part of the Work are operational in accordance with the Contract Documents (subject to any qualifications noted in the report reflecting matters which are not of a material nature), and subject to the Consultant certifying that the Contractor has attained completion, the Contractor may submit a Proper Invoice for final payment. The Contractor’s Proper Invoice for final payment shall be accompanied by any documents or materials required as part of a Proper Invoice pursuant to paragraph 5.2.2 together with the following, where applicable:

.1 all required manufacturers’ inspection reports, certifications, guarantees, warranties and other similar documentation as specified in the Contract Documents;

.2 all maintenance manuals, operating instructions, maintenance and operating tools, replacement parts or materials as specified in the Contract Documents;

.3 certification by all permit issuing authorities having jurisdiction indicating approval of all permitted installations forming part of the Project;

.4 certification by all testing, commissioning, cleaning or inspection authorities or associations as specified in the Contract Documents;

- .5 all required “as-built”, “as-installed” or “record drawings” in the form specified in the Contract Documents; and
- .6 statement of reconciliation of all change orders or claims against the Contract.”
- .2 In paragraph 5.7.2:
- (i) Delete from line 1 the words “an application” and replace them with the words “a *Proper Invoice*”
 - (ii) Delete from line 1 the words “calendar days” and replace them with the words “*Working Days*”.
 - (iii) Delete from line 2 the words “validity of the application” and replace them with the words “the validity of the *Proper Invoice*”;
 - (iv) Delete from line 2 the words “the application is valid” and replace them with the words “the *Proper Invoice* is valid”;
 - (v) At the end of line 3 add the words “and, if applicable, issue a “Notice of Non-Payment” pursuant to the Construction Act on behalf of the Owner.”
- .3 In paragraph 5.7.3:
- (vi) Delete from line 2 the words “calendar days” and replace them with the words “*Working Days*”.
 - (vii) Replace the words “application for final payment” with the words “*Proper Invoice* respecting final payment”; and
 - (viii) Add the following to the end:

“The issuance of such final certificate in no way relieves the *Contractor* from correcting any incomplete work or any defects or deficiencies in the *Work* not readily apparent at the time of issuance of such certificate.”
 - (ix) Delete paragraph 5.7.4 in its entirety and replace it with the following:

“5.7.4 Payment of a *Proper Invoice* for final payment shall be made by the *Owner* in accordance with paragraph 5.3.1.3.”

GC 5.10 – LIENS

- .1 Add new GC 5.10 as follows:
- 5.10.1 In the event that a construction lien is registered against the *Project* by or through a *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 ten (10) days, ensure that any and all construction liens and certificates of action are discharged, released or vacated by the posting of security; and
 - .2 in the case of written notices of lien, ensure that such notices are withdrawn, in writing.
- 5.10.2 In the event that the *Contractor* fails to conform with the requirements of GC 5.10.1, the *Owner* may set off and deduct from any amount owing to the *Contractor*, all costs and associated expenses, including the costs of borrowing the appropriate cash,

letter of credit or bond as security and legal fees and disbursements. If there is no amount owing by the *Owner* to the *Contractor*, then the *Contractor* shall promptly reimburse the *Owner* for all of the said costs and associated expenses.”

PART 6 - CHANGES IN THE WORK

GC 6.1 CHANGES IN THE WORK

.1 Add new paragraphs 6.1.3 through 6.1.11:

“6.1.3 Unit prices included in the *Contract*, or prices pro rata thereto, will be used in the first instance in pricing changes.

6.1.4 Where work is added pursuant to **GC 6.2 Change Order** or **GC 6.3 Change Directive**, the *Contract Price* shall be increased only by the net actual value of the work added including taxes, but excluding *Value Added Taxes*, plus the following, identified separately:

.1 *Contractor's* mark-up on its own work:

<u>Overhead</u>	<u>Profit</u>	<u>Change Value</u>
10%	10%	between \$0 to \$999.99
10%	7%	between \$1,000.00 to \$4,999.99
10%	5%	over \$5,000.00

.2 *Contractor's* mark-up on Subcontractor's work:

<u>Overhead</u>	<u>Profit</u>	<u>Change Value</u>
5%	10%	between \$0 to \$999.99
5%	7%	between \$1,000.00 to \$4,999.99
5%	5%	over \$5,000.00

.3 *Subcontractor's* mark-up on its own work:

- .1 *Overhead*: 10%
.2 *Profit*: 5%

6.1.5 *Overhead* percentage identified above shall be as defined in Document 00 73 00, Amendments to Definitions.

6.1.6 Labour costs shall be the actual, prevailing rates at *the Place of Work* paid to the workers, plus Statutory charges on labour including Workers' Compensation, Unemployment Insurance, Canada Pension, Vacation Pay, Hospitalization and Medical Insurance.

6.1.7 Quotations for changes to the *Work* shall be accompanied by itemized breakdowns together with detailed, substantiating quotations or cost vouchers from *Subcontractors* and *Suppliers*.

6.1.8 Unit and Alternative Prices included in the *Contract* include *Supply*, *Installation*, *Products*, equipment, services, materials, labour, *Overhead*, profit and taxes, but exclude *Harmonized Sales Taxes (HST)*.

- 6.1.9 The *Owner*, through the *Consultant*, reserves the right to authorize payment for changes in the *Work* by means of *Cash Allowance Disbursement Authorizations*.
- 6.1.10 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*.
- 6.1.11 If any change or deviation in, or omission from the *Work* is made by which the amount of *Work* to be performed is decreased, or if the whole or a portion of the *Work* is dispensed with, no compensation is claimable by the *Contractor* for any loss of anticipated profit in respect thereof."

GC 6.2 CHANGE ORDER

- .1 Delete paragraph 6.2.1 and substitute:
 - "6.2.1 When a change in the *Work* is proposed or required, the *Consultant* shall provide the *Contractor* with written description of the proposed change in the *Work*. The *Contractor* shall promptly present, in a form acceptable to the *Consultant*, a method of adjustment or an amount of adjustment for the *Contract Price*, if any, and the adjustment in the *Contract Time*, if any, for the proposed change in the *Work*. The *Contractor* shall also provide the following:
 - .1 The method of adjustment or an amount of adjustment for the *Contract Price*, if any, and the adjustment in the *Contract Time*, from the *Subcontractors* on the *Subcontractors'* letterhead.
 - .2 Quotations submitted by the *Subcontractors* and the *Contractor* shall have a complete breakdown for all items of material, a total number of hours for labour, and a dollar rate applied against individual material items and labour quantities."
- .2 Delete from 6.2.2 line 1 "or to the method to be used to determine the adjustments".

GC 6.3 CHANGE DIRECTIVE

- .1 Delete 6.3.7.1(1) and substitute it with " (1) carrying out the work, including necessary supervisory services".
- .2 Delete 6.3.7.1(2) and substitute it with "(2) intentionally left blank."
- .3 Delete 6.3.7.1(3) and replace with:
 - "(3) engaged in the preparation of *Shop Drawings*, fabrication drawings, coordination drawings and project record drawings: or..."
- .4 Delete 6.3.7.1(4) and replace with:
 - "(4) including clerical staff engaged in processing changes in the *Work*."

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

- .1 Add new paragraph 6.4.5 as follows:
 - "6.4.5 The *Contractor* confirms that, prior to bidding the *Project*, it carefully investigated the *Place of the Work* and applied to that investigation the degree of care and skill described in paragraph 3.14.1, given the amount of time provided between the issue of the bid documents and the actual closing of bids, the degree of access provided to the *Contractor* prior to submission of bid, and the sufficiency

and completeness of the information provided by the *Owner*. The *Contractor* is not entitled to compensation or to an extension of the *Contract Time* for conditions which could reasonably have been ascertained by the *Contractor* by such careful investigation undertaken prior to the submission of the bid.”

GC 6.5 DELAYS

- .1 Delete the period at the end of paragraph 6.5.1, and substitute the following words: “, but excluding any consequential, indirect or special damages.”
- .2 Add new subparagraph 6.5.6 as follows:
 - “6.5.6 If the *Contractor* is delayed in the performance of the *Work* by an act or omission of the *Contractor* or anyone employed or engaged by the *Contractor* directly or indirectly, or by any cause within the *Contractor’s* control, then the *Contract Time* shall be extended for such reasonable time as the *Consultant* may decide in consultation with 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 all services required by the *Owner* from the *Consultant* as a result of such delay by the *Contractor* and, in particular, the cost 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 provisions of these General Conditions and any later, actual date of *Substantial Performance of the Work* achieved by the *Contractor*.”

PART 7 - DEFAULT NOTICE

GC 7.2 CONTRACTOR’S RIGHT TO SUSPEND THE WORK OR TERMINATE THE CONTRACT

- .1 Delete subparagraph 7.2.3.1 and substitute:
 - “7.2.3.1 Intentionally left blank.”
- .2 Delete subparagraph 7.2.3.3 and substitute:
 - “7.2.3.3 The *Owner* fails to pay the *Contractor* when due, the amounts certified by the *Consultant* or award by arbitration or a Court, except where the *Owner* has a bona fide claim for setoff, or”
- .3 Delete from 7.2.3.4 line 2 “OF THE OWNER”.
- .4 Add new paragraph 7.2.6 as follows:
 - “7.2.6 If the *Contractor* terminates the *Contract* under the conditions described in this GC 7.2, the *Contractor* shall be entitled to be paid for all work performed to the date of termination. The *Contractor* shall also be entitled to recover the direct costs associated with termination, including the costs of demobilization, losses sustained on *Products* and construction machinery and equipment.”

PART 8 - DISPUTE RESOLUTION

GC 8.1 AUTHORITY OF THE CONSULTANT

- .1 Delete last sentence of 8.1.3 and substitute the following sentence:

"If it is subsequently determined that such instructions were at variance with the *Contract Documents*, the *Owner* shall pay the *Contractor* costs incurred by the *Contractor* in carrying out such instructions which the *Contractor* was required to do beyond the requirements of the *Contract Documents*, including costs resulting from interruption of the *Work*."

GC 8.2 NEGOTIATION, MEDIATION AND ARBITRATION

- .1 Add new paragraphs 8.2.9 to 8.2.14 as follows:

- "8.2.9 Within five days of receipt of the notice of arbitration by the responding party under paragraph 8.2.6, the *Owner* and the *Contractor* shall give the *Consultant* a written notice containing:
- .1 a copy of the notice of arbitration
 - .2 a copy of supplementary conditions 8.2.9 to 8.2.14 of the *Contract*, and;
 - .3 any claims or issues which the *Contractor* or the *Owner*, as the case may be, wishes to raise in relation to the *Consultant* arising out of the issues in dispute in the arbitration.
- 8.2.10 The *Owner* and the *Contractor* agree that the *Consultant* may elect, within ten *Working Days* of receipt of the notice under paragraph 8.2.9, to become a full party to the arbitration under paragraph 8.2.6 if the *Consultant*:
- .1 has a vested or contingent financial interest in the outcome of the arbitration;
 - .2 gives the notice of election to the *Owner* and the *Contractor* before the arbitrator is appointed;
 - .3 agrees to be a party to the arbitration within the meaning of the rules referred to in paragraph 8.2.6; and,
 - .4 agrees to be bound by the arbitral award made in the arbitration.
- 8.2.11 If an election is made under paragraph 8.2.10, the *Consultant* may participate in the appointment of the arbitrator and notwithstanding the rules referred to in paragraph 8.2.6, the time period for reaching agreement on the appointment of the arbitrator shall begin to run from the date the *Owner* receives a copy of the notice of arbitration.
- 8.2.12 The arbitrator in the arbitration in which the *Consultant* has elected under paragraph 8.2.10 to become a full party may:
- .1 on application of the *Owner* or the *Contractor*, determine whether the *Consultant* has satisfied the requirements of paragraph 8.2.10; and
 - .2 make any procedural order considered necessary to facilitate the addition of the *Consultant* as a party to the arbitration.
- 8.2.13 The provisions of paragraph 8.2.9 shall apply mutatis mutandis to written notice to be given by the *Consultant* to any sub-consultant.
- 8.2.14 In the event of notice of arbitration given by a *Consultant* to a sub-consultant, the sub-consultant is not entitled to any election with respect to the proceeding as outlined in 8.2.10, and is deemed to be bound by the arbitration proceeding."

GC 8.3 RETENTION OF RIGHTS

- .1 Add new paragraph 8.3.3 as follows:

- “8.3.3 If the *Owner* gives the notice in writing described in paragraph 8.2.6 to have a dispute resolved by arbitration, the *Contractor* agrees that this paragraph 8.3.3 shall be construed as a formal consent to the stay of any lien proceedings until an award is rendered in the arbitration or such dispute is otherwise resolved between the parties. In no event shall the *Contractor* be deprived of its right to enforce its lien against the *Project* should the *Owner* fail to satisfy any arbitral award against it in full on the dispute in respect of which the lien proceedings were commenced. Provided nothing in this paragraph 8.3.3 shall prevent the *Contractor* from taking the steps required by the *Construction Act* to preserve and/or perfect a lien to which it may be entitled.”

PART 9 - PROTECTION OF PERSONS AND PROPERTY

GC 9.1 PROTECTION OF WORK AND PROPERTY

- .1 Delete subparagraph 9.1.1.1 and substitute:
- “9.1.1.1 errors in the *Contract Documents* which the *Contractor* could not have discovered applying the standard of care described in paragraphs 3.4.1 of GC 3.4, **DOCUMENT REVIEW** and 3.14.1 of GC 3.14 **PERFORMANCE BY CONTRACTOR.**”
- .2 Delete paragraph 9.1.2 and substitute:
- “9.1.2 Before commencing any work, the *Contractor* shall determine the locations of all underground utilities and structures indicated in the *Contract Documents* or that are discoverable by applying to an inspection of the *Place of the Work* the degree of care and skill described in paragraph 3.14.1.”
- .3 Add new paragraph 9.1.5 as follows:
- “9.1.5 The *Contractor* shall neither undertake to repair and/or replace any damage whatsoever to the work of other contractors, or to adjoining property, nor acknowledge 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*. However, where there is danger to life or public safety, the *Contractor* shall take such emergency action as it deems necessary to remove the danger.”

GC 9. 2 TOXIC AND HAZARDOUS SUBSTANCES AND MATERIALS

- .1 Add to paragraph 9.2.6 after the word “responsible”, the following new words:
- “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 damage to the property of the Owner or others,”
- .2 Add to paragraph 9.2.8 after the word “responsible”, the following new words:
- “or that 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 damage to the property of the Owner or others, ”

GC 9.4 CONSTRUCTION SAFETY

- .1 Delete paragraph 9.4.1 and substitute:

“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*.”

- .2 Add new paragraphs 9.4.2 through 9.4.4 as follows:

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

- .1 a current WSIB clearance certificate; .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 of the *Contractor’s* in-house safety-related programs;
- .4 a copy of the Notice of Project filed with the Ministry of Labour naming itself as “constructor” under OHSA.

9.4.3 The *Contractor* shall indemnify and save harmless the *Owner*, its agents, officers, directors, employees, consultants, successors and assigns from and against the consequences of any and all safety infractions committed by the *Contractor* under the *Occupational Health and Safety Act*, [OHSA], including the payment of legal fees and disbursements on a solicitor and client basis. Such indemnity shall apply to the extent to which the *Owner* is not covered by insurance, provided that the indemnity contained in this paragraph shall be limited to costs and damages resulting directly from such infractions and shall not extend to any consequential, indirect or special damages.

9.4.4 The *Owner* undertakes to include in its contracts with other contractors and/or in its instructions to its own forces the requirement that the other contractor or own forces, as the case may be, will comply with directions and instructions from the *Contractor* with respect to occupational health and safety and related matters. The text of such instruction follows:

“LANGUAGE FOR OWNER PERSONNEL OR FOR THIRD PARTY CONTRACTORS ENTERING A PROJECT SITE WHERE THE CONTRACTOR HAS ASSUMED OVERALL RESPONSIBILITY – IN CONTRACT – FOR OCCUPATIONAL HEALTH AND SAFETY

The (trade or employee) acknowledges that the work it will perform on behalf of the *Owner* requires it to enter a job site which is under the total control of a *Contractor* which has a *Contract* with [*Owner*].

The (trade or employee) acknowledges that [name of *Contractor*] has assumed overall responsibility for compliance with all aspects of the health and safety legislation of Ontario, including all the responsibilities of the “constructor” under the *Occupational Health and Safety Act (Ontario)*. Further, (trade or employee) acknowledges that [name of *Contractor*] is also responsible to the [*Owner*] to coordinate and schedule the activities of our work with the *Work* of the *Contractor*.

We agree to comply with [name of *Contractor*] directions and instructions with respect to occupational health and safety and coordination. We acknowledge that it will be cause for

termination under our contract with the *Owner* should (I/we) fail or refuse to accept the direction and instruction of the *Contractor* with respect to matters of occupational health and safety or matters related to coordination of work.

We agree to have the *Contractor* named as an additional insured on our comprehensive liability policy.”

GC 9.5 MOULD

- .1 Delete subparagraph 9.5.3.3 and substitute:

“9.5.3.3 Extend the *Contract Time* for such reasonable time as the *Consultant* may recommend in consultation with the *Contractor*. 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 reasonable costs incurred as a result of the delay and as a result of taking those steps, and “

PART 10 - GOVERNING REGULATIONS

GC 10.1 TAXES AND DUTIES

- .1 Add new paragraph 10.1.3 as follows:

“10.1.3 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* or the *Owner's* representative, assist with 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. “

GC 10.2 LAWS, NOTICES, PERMITS AND FEES

- .1 Add to the end of paragraph 10.2.4, the following words:

“The *Contractor* shall notify the Chief Building Official or the registered code agency where applicable, of the readiness, substantial completion, and completion of the stages of construction set out in the Ontario Building Code. The *Contractor* shall be present at each site inspection by an inspector or registered code agency as applicable under the Ontario Building Code.”

- .2 Delete from the first line of paragraph 10.2.5 the word, “The” and substitute the words:

“Subject to paragraph 3.4.1, the”

PART 11 - INSURANCE AND CONTRACT SECURITY

- .1 Add new paragraph 11.1.1.8 as follows:

“11.1.1.8 Wrap Up Liability insurance provisions for project and existing structure for not less than \$10 million for duration of Contract and with following characteristics:

- .1 Definition: General liability insurance placed on construction project and existing structure insuring all interested parties, and combining all interests on a single policy as defined by CCDC 21.

- .2 Contractor shall purchase Wrap Up Liability Insurance covering the Owner, general contractor, subcontractors and Consultants (excluding coverage for professional errors or omissions). Contractor shall submit proof of Wrap Up Liability Insurance prior to commencing the Work.
- .3 The policy shall be in force for the entire project term, and maintain a dedicated limit for the Contract, and for the completed operations hazards, for a period of not less than two years after Substantial Performance of the Work.
- .4 Coverage shall be equal to or greater than the requirements stipulated in IBC 2100, (except for damage to the project which shall be covered under the Contractor's "Broad Form" policy). Damage to existing structure shall be covered by Wrap Up Liability insurance.

PART 12 - INDEMNIFICATION, WAIVER OF CLAIMS AND WARRANTY

GC 12.2 WAIVER OF CLAIMS

- .1 Delete the last sentence of subparagraph 12.2.3.4 and substitute:

"For purposes of this subparagraph 12.2.3.4, "substantial defects or deficiencies" means those defects or deficiencies in the *Work* where the reasonable cost of repair of such defects or deficiencies exceeds:

 - .1 if the *Contract Price* is \$2 million or less, the sum of \$50,000, before HST;
 - .2 if the *Contract Price* exceeds \$2 million, the sum of \$100,000, before HST.

In any event, "substantial defects or deficiencies" shall include defects or deficiencies in the *Work* which affect the *Work* to such an extent or in such a manner that a significant part or the whole of the *Work* is unfit for the purpose intended by the *Contract Documents*."

GC 12.3 WARRANTY

- .1 12.3.2. Delete from the first line the word, "The" and substitute the words:

"Subject to paragraph 3.4.1, the..."

ADDITIONAL PART

- .2 Add new PART 13:

"PART 13 OTHER PROVISIONS

GC 13.1 OWNERSHIP OF MATERIALS

- 13.1.1 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*."

GC13.2 CONSTRUCTION LIENS

- 13.2.1 In the event that a construction lien is registered against the *Project* by or through a *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 ten (10) days, ensure that any and all construction liens and certificates of action are discharged, released or vacated by the posting of security; and
 - .2 in the case of written notices of lien, ensure that such notices are withdrawn, in writing.
- 13.2.2 In the event that the *Contractor* fails to conform with the requirements of 13.2.1, the *Owner* may set off and deduct from any amount owing to the *Contractor*, all costs and associated expenses, including the costs of borrowing the appropriate cash, letter of credit or bond as security and legal fees and disbursements. 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.”

GC13.3 CONTRACTOR DISCHARGE OF LIABILITIES

- 13.3.1 In addition to the obligations assumed by the *Contractor* pursuant to GC 3.7, 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.

GC 13.4 AS-BUILT DRAWINGS

- 13.4.1 Unless otherwise provided in the *Contract Documents*, the *Contractor* shall prepare *As-Built Drawings* and provide them to the *Consultant* for review.

GC13.5 DAILY REPORTS/DAILY LOGS

- 13.5.1 The *Contractor* shall cause its supervisor, or such competent person as it may delegate, to prepare a daily log or diary reporting on weather conditions, work force of the *Contractor*, *Subcontractors*, *Suppliers* and any other forces on site and also record the general nature of *Project* activities. Such log or diary shall also include any extraordinary or emergency events which may occur and also the identities of any persons who visit the site who are not part of the day-to-day work force.
- 13.5.2 The *Contractor* shall also maintain records, either at its head office or at the job site, recording manpower and material resourcing on the *Project*, including records which document the activities of the *Contractor* in connection with GC 3.5, and comparing that resourcing to the resourcing anticipated when the most recent version of the schedule was prepared pursuant to GC 3.5.

GC 13.6 NEUTRAL APPOINTING AUTHORITY

- 13.6.1 For purposes of the Rules for Mediation and Arbitration of Construction Disputes CCDC 40, the term “neutral appointing authority”, as used in both the Rules for Mediation of CCDC 2 Construction Disputes and the Rules for Arbitration of CCDC 2 Construction Disputes shall mean the head of the construction section of the ADR Institute of Ontario, Inc. presiding at the time notice of the dispute is given pursuant to the *Contract*.”

END OF DOCUMENT

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises general renovations inside an arena facility, located at 5 Parkside St, Minden, ON ; and further identified as "Town of Minden Hills S.G. Nesbitt Memorial Arena Expansion"
- .2 The Work of this Contract includes furnishing labour, materials, equipment, services and other related expenses to execute complete construction of facility specified under Contract Documents.
- .3 Without limiting generality of foregoing, Contractor shall be responsible for coordination of various parts of the Work so that no part is left in an unfinished or incomplete condition.

1.2 WORK BY OWNER OR UNDER OTHER CONTRACTS

- .1 Work Not-In-Contract (NIC): Term "NIC" means Work of this Project which is not being performed or Provided under this Contract; term means "Not In this Contract" or "Not a Part of the Work to be Performed or Provided by Contractor". "NIC" Work may be specified or indicated on Drawings as an aid to Contractor in scheduling amount of time and materials necessary for completion of Contract.
- .2 Separate Contracts:
 - .1 Owner may have awarded separate contract(s) for construction operations at Project site. Cooperate and coordinate fully with other contractors so work of those contracts may be carried out smoothly without interfering with or delaying work under this Contract.
 - .2 Immediately report defects, which affect quality and performance of the Work, in writing to Consultant. Commencement of parts of the Work, in existing areas and in areas provided by other contractors, will be deemed to signify Contractor's acknowledgment and acceptance of those parts of the Work.

1.3 OWNER-SUPPLIED /CONTRACTOR-INSTALLED (O/C) PRODUCTS

- .1 Owner's Responsibilities: Owner will supply products indicated and perform the following, as applicable:
 - .1 Provide to Contractor Owner-reviewed Product Data, Shop Drawings, and Samples.
 - .2 Provide for delivery of Owner-supplied products to Project site.
 - .3 Upon delivery, inspect, with Contractor present, delivered items. If upon delivery, Owner-supplied products are damaged, defective, or missing, arrange for replacement.
 - .4 Obtain manufacturer's inspections, service, and warranties.
 - .5 Inform Contractor of earliest available delivery date for Owner-supplied products.
- .2 Contractor's Responsibilities: The Work includes the following, as applicable:
 - .1 Designate delivery dates of Owner-supplied products in Contractor's construction schedule, utilizing Owner-supplied earliest available delivery dates.
 - .2 Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-supplied products in the Work.
 - .3 Receive, unload, handle, store, protect, and install Owner-supplied products.

- .4 Make building services connections for Owner-supplied products.
 - .5 Protect Owner-supplied products from damage during storage, handling, and installation and prior to Substantial Performance of the Work.
 - .6 Repair or replace Owner-supplied products damaged following receipt.
- .3 List of Owner-Supplied/Contractor-Installed (O/C) Products:
- .1 Refer to Drawings.

1.4 WORK RESTRICTIONS

- .1 Comply with restrictions on construction operations. Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .2 Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- .3 Ensure only necessary tools and equipment are brought to each area of work where access by public is possible. Keep constant check on these items and, at end of each Work shift, bring all tools and equipment to storage room as directed.
- .4 Smoking and Controlled Substance Restrictions: Use of tobacco products , alcoholic beverages, and other controlled substances on Project site or on Owner's property is not permitted.
- .5 Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

1.5 ACCESS TO SITE

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.
- .2 Maintain temporary entrances to building(s) including enclosed hoardings as required. Maintain access to existing service entrance(s) at all times, including ready access for vehicles. Bridge excavations with construction to safely support any loads that could be imposed and provide personnel to assist in deliveries to building(s) as required.
- .3 Restrict access of non-construction personnel to site, except for Contractor's authorized visitors.
- .4 Refer to Section 01 50 00 for requirements pertaining to temporary vehicular access and parking.

1.6 WORK RESTRICTIONS

- .1 Comply with restrictions on construction operations. Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .2 Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- .3 Ensure only necessary tools and equipment are brought to each area of work where access by public is possible. Keep constant check on these items and, at end of each Work shift, bring all tools and equipment to storage room as directed.

- .4 On-Site Work Hours: Limit work on site to normal business hours, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.
 - .1 Owner reserves the right to request that an activity be carried out at specific date and time to ensure comfort of occupants and staff.
 - .2 Hours for delivery of materials: Conform to existing facility's requirements for use of loading dock and delivery spaces.
- .5 Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:
 - .1 Notify Owner in writing, of planned shutdowns in accordance with requirements of this Section and Owner's special procedures appended to Section 01 35 00. Provide not less than 48 hours advance notification of proposed utility interruptions.
 - .2 Obtain Owner's written permission before proceeding with utility interruptions.
- .6 Noise, Vibration, Dust, and Odours: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
 - .1 Notify Owner not less than 48 hours in advance of proposed disruptive operations.
 - .2 Obtain Owner's written permission before proceeding with disruptive operations.
- .7 Smoking and Controlled Substance Restrictions: Use of tobacco products , alcoholic beverages, and other controlled substances on Project site or on Owner's property is not permitted.
- .8 Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

1.7 COORDINATION WITH OCCUPANTS

- .1 This Project involves work by way of renovations in buildings which will be in use or be occupied during course of the Work. Project also involves work that is adjacent to structures which are in use or are being occupied.
- .2 Accordingly, Contractor, without in any way limiting its responsibilities under Contract, shall take all reasonable steps to manage and maintain fire exits, building access and egress, continuity of electric power and all other utilities, suppression of dust and noise, avoidance of conditions likely to propagate mould of any kind and all other steps reasonably necessary to promote and maintain safety and comfort of users and occupants of such structures or adjacent structures.
- .3 Before entering existing premises to carry out the Work or to obstruct or take out of use any area of existing premises, or to cause any other interference, request meeting with Consultant and Owner in order to reach agreement as to time and length of time required for interference, possession, obstruction or removal from use of such area or services.

1.8 USE OF SITE BY CONTRACTOR

- .1 Restricted Use of Site: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits or site limits and as indicated by requirements of this Section. Contractor shall have complete and exclusive use of Place of the Work until Substantial Performance of the Work and shall assume such responsibility for the Place of the Work.

- .1 Confine extent of construction activities to area indicated on Drawings as site and/or within area defined by property lines. Confine all equipment, materials, debris, offices, storage sheds and storage areas to area previously defined.
 - .2 Should Contractor require that boundaries of the Place of The Work be temporarily extended, obtain approval from Consultant and Owner. Make allowance in Contract Price for potential work extending beyond that which is indicated and defined by the Contract limits or site limits, as required to complete The Work. Perform such work at no additional cost to Owner.
 - .3 Assume responsibility for care, custody and control of property which is assigned for performance of the Work. Assume responsibility for and Make Good damage to existing property attributable to performance of the Work.
 - .4 Maintain existing building in weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.
- .2 Driveways, Walkways and Entrances: Keep driveways, garages, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
- .1 Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - .2 Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - .3 Restore existing paving, sidewalks, curbs and landscaping damaged during construction. Provide paving, walks, curbs and landscaping to match existing conditions where not otherwise shown. Provide sod to replace damaged grass and maintain it until it has rooted properly.
- .3 Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- .4 Owner reserves right to occupy and use portions of premises, whether partially or entirely completed, or whether completed on schedule or not, Provided such occupancy does not interfere with Contractor's continuing the Work. Partial occupancy or installation of equipment by Owner does not imply acceptance of the Work in whole or in part, nor shall it imply acknowledgment that terms of Contract are fulfilled.

1.9 SIGNS, ADVERTISING AND PUBLICATIONS

- .1 Do not erect or display devices, signs or advertisements of labour, materials or services Provided to the Work. Signs relative to fire, danger and safety are exempted from this requirement.
- .2 Do not consent to advertising of the Work, of any kind, without Owner's and Consultant's written approval. Do not consent to mention of the Work in any advertising or articles in any publication relating to the Work without approval and written permission from Owner and Consultant.

1.10 SPECIFICATIONS FORMATS AND CONVENTIONS

- .1 Specifications are addressed to the Contractor. Specifications are not intended as detailed description of installation methods, but serve to indicate particular requirements in completing the Work.

- .2 Where Contract Documents do not Provide sufficient information for complete installation of item, then as supplement, comply with manufacturer's written instructions for quality of Work.
- .3 Portions of Specifications are written in short form in modified CSI/CSC 3-part Section format. Therefore, it shall be understood that where item of the Work is stated in heading followed by material, equipment, component or operation, words "shall be", "shall consist of" or similar words or phrases are implied which denote supply, fabricate and supply, Install, Provide or commission of such materials, equipment or operations for component of the Work designated by heading.
- .4 Where items in Contract Documents are referred to in singular, Provide as many as required to complete the Work. Words used in one gender only shall mean females as well as males and conversely.
- .5 Drawings, Lists or Schedules of Items are intended to show scope and arrangement of the Work. For location of item described refer to Drawings or Schedules unless location is stipulated in Specifications.
- .6 Text Colour: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colours or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
- .7 Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
- .8 Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- .9 Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

1.11 DISCREPANCIES/CONFLICTS/OMISSIONS

- .1 Contract Documents including Drawings, Specifications and other information pertaining to the Work are intended to be in compliance with federal, provincial and municipal laws, by-laws, regulations and other requirements of authorities having jurisdiction. Perform Work in conformity with such requirements.
- .2 If discrepancies or conflicts in, or omissions from Drawings, Specifications or other Contract Documents are suspected, or if there is doubt as to meaning or intent thereof, notify Consultant at once.
- .3 Specifications: If specifications require compliance with two or more requirements which establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Consultant for a decision before proceeding.
- .4 Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Consultant for a decision before proceeding.
- .5 Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. Indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Consultant for a decision before proceeding.
- .6 Comply with Consultant's written instructions or explanations and proceed accordingly.

- .7 If Changes to the Work are suspected or required, refer to Section 01 20 00, for appropriate procedures.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Definitions:
 - .1 Unit Prices: Unit prices are amounts stipulated by bidders for Owner-solicited unit prices which can be stated as additions for extra work, deductions for deleted work or no change to the Contract Price.
 - .2 Alternative Prices: Alternative Prices are amounts stipulated by bidders for Owner-solicited alternatives which can be stated as additions, deductions or no change to the Contract Price.
 - .3 Itemized Prices: Itemized prices are for work included in the bid price and are provided for information purposes only. They will not be used to adjust the scope of the work or the Contract Price.

1.2 CASH ALLOWANCES

- .1 Conform to Contract Definitions and Supplementary Conditions.
- .2 Disbursements from Cash Allowances are intended for Work not shown or described in the Bid Documents and shall be authorized by Consultant in writing, as applicable.
- .3 The Owner, through the Consultant, reserves the right to authorize payment for changes in the Work by means of Cash Allowance Disbursement Authorizations. Contract Price shall be adjusted by means of a Change Order.
- .4 Extend to Owner refunds, trade and quantity discounts which may be received in purchasing under Cash Allowances, except cash discounts for prompt payment.
- .5 In submitting final adjustments of Cash Allowances, include summary statements and copies of receipted invoices substantiating purchases under Cash Allowances.
- .6 Where costs under a cash allowance exceed the amount of the allowance, unexpended amounts from other cash allowances may be reallocated to cover the shortfall.
- .7 Prepare schedule jointly with Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work will not be delayed.
- .8 At Consultant's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- .9 Purchase products and systems selected by Consultant from the designated supplier.
- .10 Coordinate and process submittals for allowance items in same manner as for other portions of the Work.
- .11 Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

1.3 UNIT PRICES

- .1 Without limiting its rights under the Instructions to Bidders, the Owner reserves the right to accept or reject any or all of the unit prices. Unit prices do not include Harmonized Sales Tax (HST), but include all other eligible taxes. These amounts shall be irrevocable for the period of the Contract.
- .2 Ensure unit prices include labour, materials, Products, equipment, services and respective overhead, profit (excluding applicable sales or value added taxes), disbursements and related charges and represent actual addition for extra Work or credit for deleted Work, to Contract Price.
- .3 Schedule of unit prices: Refer to Bid Form.

1.4 ALTERNATIVE PRICES

- .1 Alternative prices shall include all labour, materials, Products, equipment, services and respective Overhead, profit, taxes (excluding Harmonized Sales Tax (HST)), disbursements and related charges required for substituting, deleting or changing of materials, Products and/or construction from those shown or specified and represent the total amounts which will be added to or deducted from the Base Bid Price (as noted for each item).
- .2 If any or all alternative prices listed in the Supplementary Bid Forms are required to be included in the Contract, no change to Contract Time will be allowed unless otherwise stated with respective alternative price
- .3 Schedule of alternative prices: Refer to Bid Form.

1.5 ITEMIZED PRICES

- .1 Itemized prices shall be included in Base Bid Price. Itemized prices shall include all labour, materials, Products, equipment, services, and respective Overhead, profit, taxes (excluding the Harmonized Sales Tax (HST)), disbursements and related charges required to Provide these items and represent total amounts in the Base Bid Price.
- .2 Schedule of alternative prices: Refer to Bid Form.

1.6 CONTRACT MODIFICATION PROCEDURES

- .1 Conform to Contract Definitions pertaining to CHANGES IN THE WORK as modified by any Supplementary Conditions.
- .2 CHANGES IN THE WORK DUE TO A SUPPLEMENTAL INSTRUCTION
 - .1 Consultant will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Price or the Contract Time, on Consultant's standard forms.
 - .2 Supplemental Instructions do not normally include any change in Contract Price or in Contract Time. Should change in the work issued by supplemental instruction require amendments to Contract Price or adjustments to Contract Time, Contractor shall formally notify Consultant in writing within 10 Working Days of receiving Supplemental Instruction.
 - .3 If Consultant determines that change in the Work requires an amendment in Contract Price or Contract Time, Consultant will issue a Proposed Change in The Work (Contemplated Change Order) in accordance with requirements of this Section.
 - .4 Failure to notify Consultant within 10 Working Days of date of receipt of Supplemental Instruction, will be construed as acceptance of Supplemental Instruction with no additional changes in Contract Price or Contract Time.

- .3 PROPOSED CHANGES IN THE WORK (CONTEMPLATED CHANGE ORDERS)
 - .1 Any variation in the Contract involving a change in total amount of Contract Price or in Contract Time shall be initiated through Consultant in form of a Proposed Change in the Work (Contemplated Change Order or CCO) describing Work proposed under variation and requesting a quotation from Contractor.
 - .2 Consultant will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Price or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - .1 Proposed Changes in The Work issued by Consultant are not instructions either to stop work in progress or to execute the proposed change, except where such Work specifically affects proposed change.
 - .2 Immediately inform all relevant Subcontractors and Suppliers of the proposed change.
 - .3 Within 5 Working Days of receipt of Proposed Change in The Work, submit a quotation estimating cost adjustments to the Contract Price and the Contract Time necessary to execute the change.
 - .1 Include all Work described in the Proposed Change in the Work and all other Work caused, however incidental it may be, by the proposed change. Once Change Order is issued by Owner, no further claims for extra costs or time extensions will be accepted.
 - .2 Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - .3 Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - .4 Only include costs directly attributable to the change. Do not include overhead costs.
 - .5 Include an updated construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - .4 If quotation received is unacceptable, Consultant will reject quotation and request revised quotation from Contractor.
 - .5 When Consultant deems quotation acceptable, Consultant will prepare a Change Order (CO).
 - .6 Value of changes in Work shall be determined and processed in accordance with the General Conditions of the Contract.
 - .7 Quotation Form: Use forms acceptable to Consultant.
 - .4 CHANGE DIRECTIVES (CD)
 - .1 Change Directives (CD) instruct Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - .2 Change Directives shall be issued by Owner, through Consultant, and contain a complete description of the changes required in the Work.
 - .3 Maintain detailed records on a time and material basis of work required by the Change Directive.

- .4 After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.
- .5 Only include costs directly attributable to the change. Do not include overhead costs.
- .5 **CONTRACTOR'S REQUEST FOR CHANGES**
 - .1 Not later than 10 Working Days after becoming aware of circumstances which may require a change in Work or other directions, give written notice to Consultant outlining such circumstances and requesting proposed change.
 - .2 Do not perform any Work in affected area, or activities that would prevent Consultant from properly evaluating circumstances and valuation of proposed change, without obtaining written approval.
 - .3 Advise Consultant in writing of any contradictions, discrepancies, omissions or errors discovered or revealed. Do not proceed before obtaining clarifications and directions from Consultant in writing.
 - .4 Consultant will act promptly to give Contractor directions, so Work is not unreasonably delayed.
 - .5 Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change.
 - .6 Failure to follow these procedures shall result in Contractor assuming full responsibility for resulting circumstances and costs.

1.7 SCHEDULE OF VALUES (PROGRESS BILLING BREAKDOWN)

- .1 Prior to commencement of the Work, submit a detailed schedule of values supported by evidence as Consultant may reasonably direct. When accepted by Consultant, schedule of values shall be used as basis for applications for payment.
- .2 Submit to Consultant, at least 14 calendar days before first application for payment, Schedule of values for parts of Work, aggregating total amount of Contract Price, to facilitate evaluation of applications for payment.
- .3 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Consultant may reasonably require to establish value and delivery of products.
- .4 Ensure schedule of values breakdown includes itemized values, (each excluding applicable sales or value added taxes), applied against each of following:
 - .1 mobilization and start-up.
 - .2 general site expenses.
 - .3 each cash allowance amount.
 - .4 each Section of Specifications (Divisions 2 - 49 inclusive).
 - .5 assigned work amounts, if any.
 - .6 as-built Drawings broken down by Architectural, Structural, Mechanical and Electrical and communications disciplines
 - .7 deficiencies
 - .8 Project closeout, comprising separate sums for:
 - .1 manuals.
 - .2 maintenance materials.

.3 commissioning and training/demonstration for Owner's staff.

1.8 APPLICATIONS FOR PAYMENT

- .1 Make applications for payment on account as provided in in the Contract as Work progresses. Conform to requirements of Construction Act.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
- .2 Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
- .3 Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.2 GENERAL

- .1 Substitutions for Cause:
 - .1 During Bidding Period or after award of Contract, Product substitution proposals will not be reviewed except in cases where written proof from Product manufacturer/distributor has been submitted to verify specified Products:
 - .1 are unavailable (providing reasons why); and
 - .2 were ordered in advance and in accordance with manufacturer's recommendations for lead time but timely delivery of specified Products is not possible in order to maintain construction schedule.
 - .2 Submit following for each Product substitution proposal:
 - .1 Shop Drawings and applicable Product Data, including full details.
 - .2 samples; and
 - .3 difference in price, if any, in form of certified quotations of both selected and proposed substitutions.
 - .4 Sustainability submittals as described in r
 - .3 Prior to submitting proposals, submit Contractor's letter of recommendation and written certification that use of substituted Products:
 - .1 are consistent with the Contract Documents and will produce indicated results.
 - .2 will not exceed space requirements allocated for originally specified Products or, if they do, Contractor is including with substitution submission, design Drawings, to accommodate substituted Product;
 - .3 are compatible with and inert to adjacent materials;
 - .4 will not affect Project schedule due to delays in delivery and Installation.
 - .5 do not require extensive revisions to the Contract Documents.
 - .6 have been coordinated with other portions of The Work.
 - .7 have been priced to include design adjustments required to accommodate substituted Products.
 - .4 Proposed substitutions require Consultant's review and acceptance and, if there is a difference in price, extra or credit requires Owner's acceptance.
 - .5 Substitution Request Form: Use form provided in Project Manual.

- .2 Substitutions for Convenience: Not allowed.
- .3 Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.
- .4 Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Definitions:
 - .1 Submittals: documents or items required by the Contract Documents to be provided by the Contractor, such as:
 - .1 Shop Drawings, samples, models, mock-ups to indicate details or characteristics, before the portion of the Work that they represent can be incorporated into the Work; and
 - .2 As-built drawings and manuals to provide instructions to the operation and maintenance of the Work.

1.2 PROJECT COORDINATION

- .1 Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
- .2 Neither organization of Specifications into MasterFormat Divisions or CSC/CSI 3-part Section Format nor arrangement of Drawings or schedules shall affect in any way Contractor's control in, or diminish its responsibility for, dividing The Work or establishing each trade's scope of work. Claims for additional compensation arising from disputes between trades due to lack of coordination by Contractor will not be permitted. Conform to Contract Conditions as amended by any Supplementary Conditions.
- .3 Study Contract Documents to determine extent of The Work. Coordinate scope and extent of work to be performed by each trade.
- .4 Coordinate work of all trades including construction sequence, schedule and interfacing of all work. Coordinate work of each trade as required for satisfactory and expeditious completion of The Work. Ensure components to be built in are supplied in time with setting Drawings and other related information.
- .5 Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of The Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
- .6 Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
- .7 Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
- .8 Make adequate provisions to accommodate items scheduled for later installation.

1.3 COORDINATION/INTERFERENCE DRAWINGS

- .1 For all locations, before commencing installation, prepare coordination/interference drawings showing relationship of items, including, but not limited to, structure, electrical, cable trays, communication system, ductwork, conduits, piping, sprinklers, ceiling supports and framing, communication and specialized equipment located within ceiling and shaft spaces.

- .2 Contractor shall lead process of interference Drawings in coordination with mechanical, electrical or other Subcontractors as applicable.
- .3 Prepare Drawings indicating relationship of new and existing and/or unforeseen conditions including new construction or construction which existed prior to commencement of work in the area. For construction in existing areas, survey existing conditions. Show existing conditions on interference Drawings and coordinate such conditions with new work. Submit or post coordination/interference drawing files in PDF format in accordance with Shop Drawing requirements specified in this Section.
 - .1 Provide Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination/interference drawings on standard printed data.
 - .2 Use applicable Drawings as a basis for preparation of coordination/interference drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
- .4 Consultant Review: Consultant will review coordination/interference drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Consultant determines that coordination/interference drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Consultant will so inform Contractor, who shall make suitable modifications and resubmit.
- .5 Installation shall proceed in accordance with final approved interference Drawings. Work carried out without final approved interference Drawings and which does not meet requirements specified in Contract Documents or specified ceiling heights shall be removed, re-coordinated and re-installed at no additional cost to Owner.
- .6 Coordination/Interference Drawing Organization: Organize coordination/interference drawings as follows:
 - .1 Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
 - .2 Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
 - .3 Mechanical Rooms: Provide coordination/interference drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 - .4 Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 - .5 Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 - .6 Mechanical and Plumbing Work: Show the following:
 - .1 Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - .2 Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.

- .3 Fire-rated enclosures around ductwork.
- .7 Access Panels:
 - .1 Before commencing mechanical or electrical work after coordination with respective trades, prepare set of reflected ceiling plans indicating exact locations and sizes of access panels and doors. Prepare Drawings for areas/rooms designated by Consultant.
 - .2 Submit Drawings to Consultant for review. Allow Consultant to revise layout or quantity of access doors and panels, by relocating related building services a maximum of 2000 mm (6' - 7"), at no additional cost to Owner.
 - .3 Should a relocation exceed 2000 mm (6' - 7"), Contract Price will be adjusted in accordance with provisions for changes in Contract Documents.
 - .4 Finish access panels and doors to match adjacent wall and/or ceiling finish unless otherwise specified or indicated.
- .8 Electrical Work: Show the following:
 - .1 Runs of vertical and horizontal conduit 32 mm (1-1/4 inches) in diameter and larger.
 - .2 Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - .3 Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
 - .4 Location of pull boxes and junction boxes, dimensioned from column center lines.
- .9 Fire-Protection System: Show the following:
 - .1 Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

1.4 CONTRACTOR'S LIST OF PERSONNEL AND SUBCONTRACTORS

- .1 Prepare and submit a complete written list of individuals or firms proposed for each portion of the Work complete with Name, address, telephone number, and email address of entity. In addition, Provide Contractor's list of personnel and emergency contact information.
- .2 Ensure compatibility within Project team, especially between Subcontractors. Owner takes no responsibility for incompatibility (labour and otherwise) among Subcontractors and Suppliers employed on the Project.
- .3 Post copies of list in Project meeting room, in temporary field office, and in prominent location. Keep list current at all times.
- .4 Key Personnel Names: Submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, telephone numbers, and e-mail addresses.
- .5 Personnel Appointment: Appoint a senior member of staff as full-time superintendent, with full authority to commit Contractor to methods and construction schedules. Full-time superintendent shall actively participate in administration and maintenance of construction schedule. Do not replace superintendent without Owner's or Consultant's approval.

1.5 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after receiving notification of award of Contract, submit:

- .1 Workplace Safety & Insurance Certificate status,
- .2 transcription of insurances
- .3 other certificates and transcripts required by Contract Documents, Consultant or authorities having jurisdiction.

1.6 PROJECT MEETINGS

- .1 Contractor's Administrative Responsibilities: Unless otherwise indicated, Contractor's responsibilities for all project meetings are as follows:
 - .1 Schedule and conduct meetings throughout the course of The Work, including those requested at the call of Consultant or Owner, at Project site unless otherwise indicated.
 - .2 Prepare agenda for meetings. Distribute the agenda to all invited attendees.
 - .3 Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Consultant of scheduled meeting dates and times a minimum of 5 working days prior to scheduled meeting dates and times.
 - .4 Provide physical space and make arrangements for meetings.
 - .5 Preside at meetings.
 - .6 Record meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
 - .7 Distribute copies of minutes within 72 hours of meetings and transmit to meeting participants and, affected parties not in attendance.
- .2 Preconstruction Meeting (Start-up Meeting):
 - .1 After award of Contract, but no later than 15 Days after Award of Contract, request meeting of parties in Contract to discuss and resolve administrative procedures and responsibilities.
 - .2 Distribute meeting agenda including relevant items pertaining to administrative, financial, scheduling, health and safety requirements.
 - .3 Attendees:
 - .1 Authorized representative of Consultant, Subconsultants, Owner, Contractor, including superintendent, major Subcontractors, major Suppliers, and other concerned parties must be in attendance.
 - .2 Participants at the meeting must be familiar with Project and authorized to conclude matters relating to the Work.
 - .4 Agenda: Discuss items of significance that could affect progress, including but not limited to the following:
 - .1 Tentative construction schedule and progress schedule.
 - .2 Building permit status.
 - .3 Bonds and insurance certificates.
 - .4 Critical work sequencing, and long-lead items.
 - .5 Designation of key personnel and their duties.
 - .6 Lines of communications.

- .7 Procedures for processing field decisions and contract modifications including, but not limited to proposed changes (contemplated change orders), change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and other administrative requirements.
 - .8 Procedures for RFIs.
 - .9 Procedures for testing and inspecting.
 - .10 Procedures for processing applications for progress payment including, monthly progress claims, administrative procedures, photographs, and holdbacks.
 - .11 Distribution of the Contract Documents.
 - .12 Submittal procedures, including schedule of submission of shop drawings, samples, colour chips.
 - .13 Preparation of closeout documents including, As-Builts, maintenance manuals, take-over procedures, and warranties.
 - .14 Sustainability requirements.
 - .15 Working hours.
 - .16 Owner's occupancy requirements.
 - .17 Responsibility for temporary facilities and controls including but not limited to, site signage, offices, storage sheds, utilities, hoarding and similar temporary construction.
 - .18 Procedures for moisture and mold control.
 - .19 Procedures for disruptions and shutdowns, including bin locations.
 - .20 Construction waste management and recycling.
 - .21 Parking availability and procedures.
 - .22 Office, work, and storage areas.
 - .23 Equipment deliveries and priorities.
 - .24 Health and Safety.
 - .25 Security.
 - .26 Progress cleaning and housekeeping procedures.
 - .27 Owner-supplied products, where applicable.
 - .28 Appointment of inspection and testing agencies or firms.
 - .29 Insurances, and transcripts of policies.
- .3 Site Coordination/Progress Meetings:
- .1 Schedule and conduct progress meetings at Project site during the course of the work.
 - .2 Frequency: bi-weekly, or on a mutually acceptable schedule.
 - .3 Attendees: require attendance of each Subcontractor or other entity concerned with current progress or involved in planning, coordination, or performance of future activities. Ensure attendees include at the minimum, Contractor's Project manager and site superintendent, mechanical and electrical Subcontractors, and Subcontractors invited by Contractor and Owner and/or Consultant(s).
 - .4 Agenda: As a minimum, discuss the following:

- .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Status of submittals.
 - .8 Other business.
- .4 Owner, Consultant and Contractor (OCC) Progress Meetings:
- .1 Purpose: to review general project status, financial status and construction schedule.
 - .2 Frequency: monthly, or on a mutually acceptable schedule.
 - .3 Attendees: at least one senior representative of Owner, Consultant and Contractor.
 - .4 Agenda: As a minimum, discuss the following:
 - .1 Status of Proposed Changes (Contemplated Change Orders), Change Orders, and Change Directives.
 - .2 Review of proposed changes for effect on construction schedule and on completion date.
 - .3 Revisions to construction schedule.
 - .5 Chair: Consultant.
- .5 Preinstallation Meetings
- .1 Prior to start of The Work of a trade section, arrange for preinstallation meeting at Project site for parties associated with trade Section.
 - .2 Conduct a preinstallation meeting at Project site before each construction activity when required by Specifications Sections and when required for coordination with other construction
 - .3 Attendees:
 - .1 Invite Subcontractor and representatives of manufacturers and fabricators involved in, or affected, by the work of the trade involved and its coordination or integration with other materials and installations that have preceded or will follow.
 - .2 Invite Consultant, Owner and inspection and testing company's representative who may elect to attend.
 - .4 Agenda: Discuss following items as a minimum:
 - .1 Work included.
 - .2 Materials to be used.
 - .3 Storage and handling of materials.
 - .4 Installation procedures.
 - .5 Sequence and quality control.
 - .6 Project staffing.

- .7 Review of mockups.
- .8 Possible conflicts.
- .9 Compatibility requirements.
- .10 Time schedules.
- .11 Weather limitations.
- .12 Manufacturer's written instructions.
- .13 Warranty requirements.
- .14 Acceptability of substrates.
- .15 Temporary facilities and controls.
- .16 Restrictions on areas of work and other matters affecting construction including space and access limitations.
- .17 Regulations of authorities having jurisdiction.
- .18 Testing and inspecting requirements.
- .19 Coordination with other work.
- .20 Required performance results.
- .21 Protection of adjacent work.
- .22 Protection of construction and personnel.
- .5 Reporting: Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - .1 Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of The Work and reconvene the conference at earliest feasible date.

1.7 CONSTRUCTION SCHEDULE

- .1 Submit a comprehensive, fully developed, detailed horizontal bar chart (GANTT) construction schedule with activities itemized to enable Contractor and Consultant to monitor progress of The Work promptly after Contract Award. Indicate each significant construction activity separately. Construction schedule shall include adequate time for Product delivery and shop drawing preparation, review and re-submission.
 - .1 Prepare schedules using current version of Microsoft Project or similar computer software program acceptable to Owner and capable of producing Gantt-chart schedule.
 - .2 Critical Path: Identify critical path on Schedule. Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates. Sequence and scheduling of construction shall be based on maintaining continuous operation and access to the Work during construction.
 - .3 Constraints: Include constraints and work restrictions indicated in the Contract Documents including, but not limited to, work by Owner and Owner-supplied Products (if any), and work restrictions, and show how the sequence of the Work is affected.
 - .4 Consultant and Owner will review construction schedule and recommend changes. Coordinate suggested changes to construction schedule with Owner and Consultant.

- .5 Submission of construction schedule shall imply approval and concurrence of Subcontractors with proposed construction schedule.
- .6 It shall be understood that time is of the essence for this contract.
- .2 Milestones: Ensure construction schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Shop Drawings, Samples.
 - .3 Permits.
 - .4 Mobilization.
 - .5 Excavation.
 - .6 Backfill.
 - .7 Foundation work.
 - .8 Slabs on grade.
 - .9 Structural Steel.
 - .10 Cladding and Roofing.
 - .11 Interior Finishes (Walls, Floors and Ceiling).
 - .12 Plumbing.
 - .13 Lighting.
 - .14 Electrical.
 - .15 Piping.
 - .16 Controls.
 - .17 Heating, Ventilating, and Air Conditioning.
 - .18 Millwork.
 - .19 Fire Systems.
 - .20 Testing and Commissioning.
 - .21 Supplied equipment long delivery items.
- .3 Construction Schedule Updating and Reporting:
 - .1 At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule before each regularly scheduled progress meeting.
 - .2 Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule.
 - .3 Determine how construction behind schedule will be expedited and secure commitments from parties involved to do so.
 - .4 At progress meeting, discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - .5 Discuss construction schedule at progress site meetings, and identify activities that are behind schedule and provide measures to regain slippage.

- .6 Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the minutes of each such meeting.
- .7 Include a narrative report with updated schedule that indicates Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.
- .8 As the Work progresses, indicate completion percentage for each activity.
- .9 Distribute copies of approved schedule to Consultant, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
- .4 Short-term Schedule:
 - .1 On a bi-weekly basis, prepare for discussion at progress meetings, a three-week short-term schedule based on construction schedule.
 - .2 Provide sufficient information on progress of The Work to enable a status report to be produced on a bi-weekly basis. Indicate on short-term schedule, construction activities that the Owner and Consultant deem necessary.

1.8 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Accurately and neatly record deviations from Contract Documents, including addenda, Supplemental Instructions and Change Orders, caused by site conditions.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
- .4 Do not conceal Work until required information is recorded.
- .5 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 Referenced Standards to related shop drawings and modifications.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .7 Refer to Section 01 77 00 for additional requirements.

1.9 PHOTOGRAPHIC DOCUMENTATION

- .1 Preconstruction Photographic Documentation:

- .1 Before commencement of the Work, take photographs of the Place of the Work and surrounding areas, including existing items to remain during construction, from different vantage points, as directed by Consultant.
 - .2 Provide minimum of 6 photographs of the Place of The Work and 6 photographs along the lines forming the perimeter of the Place of The Work.
 - .3 Submit video recording to supplement photographs to show existing conditions prior to start of The Work.
- .2 Periodic Construction Photographs:
- .1 Take digital progress photographs weekly from from date of commencement of The Work until date of Substantial Performance of The Work, sufficient to record the state of The Work.
 - .2 Submit photographs monthly coinciding with cutoff date associated with each application for progress payment. Select vantage points to show status of construction and progress since last photographs were taken.
 - .3 Submit progress photographs in .jpg format, standard resolution along with with each application for progress payment or at frequency directed by Consultant.

1.10 SUBMITTAL PROCEDURES – GENERAL

- .1 Submittals Schedule (Shop Drawing Schedule)
 - .1 Submit promptly, but not later than 14 days after Contract Award a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Consultant and additional time for handling and reviewing submittals required by those corrections.
 - .2 Coordinate submittal schedule with list of subcontracts, the schedule of values, and construction schedule.
- .2 Administrative Requirements:
 - .1 Assemble submittals and transmit to Consultant by sending via email. Include PDF transmittal form. Include information in email subject line clearly identifying project name, project no, and submittal scope.
 - .2 Processing Time: Allow time for submittal review, including time for resubmittals, as follows.
 - .1 Time for review shall commence on Consultant's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - .2 Initial Review: Allow 10 working days for initial review of each submittal. Allow an additional 10 working days if coordination with subsequent submittals or other design consultants is required. Consultant will advise Contractor when a submittal being processed must be delayed for coordination.
 - .3 Resubmittal Review: Allow 10 working days for review of each resubmittal.
- .3 Deviations and Additional Information:

- .1 On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Consultant on previous submittals.
 - .2 Indicate by highlighting on each submittal or noting on attached separate sheet.
 - .3 Delete information not applicable to project.
 - .4 Supplement standard information to provide details applicable to project.
 - .5 Identify options requiring selection by Consultant.
- .3 Submittals Format: Submit electronic copies of each submittal unless otherwise indicated. Include the following information in each submittal:
- .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Location(s) where product is to be installed, as appropriate.
 - .4 Other necessary identification.
 - .5 Remarks.
 - .6 Transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
 - .5 Submittal purpose and description.
 - .6 Signature of transmitter.
 - .7 Other pertinent data.
 - .7 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .4 Contractor's Responsibility:
- .1 Submit to Consultant and to authorities having jurisdiction (as required), documents listed to be submitted for review. Submit promptly and in orderly sequence to not cause delay in Work.
 - .2 Do not submit materials that are not identified in Contract Documents, such submissions will be returned without review.
 - .3 Failure to submit documentation in ample time is not considered sufficient reason for increases to Contract Price or Contract Time. No claims for extension by reason of such default will be allowed.
 - .4 Final approval of authorities having jurisdiction, where required, shall be obtained prior to submitting Shop Drawings or other documentation to Consultant.

- .5 Do not proceed with, or fabricate Work affected by specific submittals until review is complete.
 - .6 Present Shop Drawings, Product Data, samples and mock-ups in SI Metric or Imperial units to match measurement system indicated on Drawings.
 - .7 Review submittals prior to submission to Consultant. This review shall represent that necessary requirements have been determined and verified, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, and dated by the Contractor, and identified as to specific project will be returned without being examined and considered rejected.
 - .8 Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
 - .9 Verify field measurements and affected adjacent Work are coordinated. Confirm and coordinate requirements pertaining to fabrication processes, quantities, construction techniques, installation and similar information.
 - .10 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
 - .11 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant's review.
 - .12 Record each review as well as inspection and testing reports in manner suitable for inclusion in closeout documentation and submission at completion of Project.
 - .13 Keep one reviewed copy of each submission on site
- .5 Consultant's Review:
- .1 Consultant will perform general review of The Work for general conformance with Contract Documents, Code and authorities having jurisdiction. Review includes review of Shop Drawings, review of field Work and review of reports produced by various inspection and testing agencies.
 - .2 Consultant will review each submittal, indicate corrections or revisions required, and return annotated files to Contractor. Consultant will indicate, via markup on each submittal, the appropriate action, as follows:
 - .1 "REVIEWED FOR GENERAL DESIGN" OR "REVIEWED AS NOTED": Upon review by Consultant, no apparent errors or omissions are discovered by Consultant, or only minor corrections are to be made. Copies will be returned to Contractor and fabrication and installation of Work may proceed.
 - .2 "REVISE AND RESUBMIT": Make changes as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.
 - .3 "REJECTED": Shop drawings are rejected. Noted copy will be returned and resubmission of corrected submittals, through same procedure indicated above, must be performed before fabrication and installation of Work proceeds.
 - .3 Review of Contractors' submittals by Consultant is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that Consultant approves detail design inherent in submittals, responsibility for which shall remain with Contractor, and such review shall not relieve Contractor of responsibility for errors or omissions or of responsibility for meeting requirements of Contract Documents.

- .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of Work of sub-trades.

1.11 PRODUCT DATA

- .1 Mark product data sheets to show applicable Products and options. Include the following:
 - .1 Manufacturer's written recommendations, Product Specifications, and installation instructions.
 - .2 Wiring diagrams showing factory-installed wiring.
 - .3 Printed performance curves and operational range diagrams.
 - .4 Testing by recognized testing agency.
 - .5 Compliance with specified standards and requirements.

1.12 SHOP DRAWINGS

- .1 Provide Shop Drawings required by Contract Documents. Insert Contractor's review stamp complete with date and signature of Contractor's reviewer.
- .2 Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
- .3 Include the following on Shop Drawings as applicable:
 - .1 Project-specific information, drawn accurately to scale.
 - .2 fabrication methods.
 - .3 layout, showing dimensions, including verified field dimensions, and clearances.
 - .4 plans, sections and details;
 - .5 materials thicknesses and finishes;
 - .6 setting, erection and sealing details.
 - .7 methods of securing, fastening and anchoring including field connections.
 - .8 capacities.
 - .9 performance characteristics.
 - .10 standards.
 - .11 operating weight.
 - .12 wiring diagrams.
 - .13 single line and schematic diagrams.
 - .14 relationship to adjacent work.
 - .15 engineer's stamp (as applicable)
- .4 Do not fabricate any portion of the Work until Shop Drawings are indicated as "REVIEWED FOR GENERAL DESIGN" or "REVIEWED AS NOTED".
- .5 Do not resubmit Shop Drawings indicated as "REVIEWED FOR GENERAL DESIGN" or "REVIEWED AS NOTED".

- .6 Resubmit Shop Drawings indicated as "REVISE AND RESUBMIT" with required changes and comments addressed. Insert letter "R" after Shop Drawing number on resubmitted Shop Drawings. Re-date and re-sign resubmitted Shop Drawings. Identify revisions from earlier submissions graphically on revised Shop Drawings;

1.13 DELEGATED-DESIGN SUBMITTALS

- .1 In addition to Shop Drawings, Product Data, and other required submittals, submit statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to the Contractor to be designed or certified by a design professional.
- .2 Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.14 SAMPLES

- .1 Submit Samples for review of kind, colour, pattern, and texture and for a comparison of these characteristics between submittal and actual component as delivered and installed. Include name of manufacturer and Product name on label.
- .2 For each sample, exhibit materials and finishes, such as colour (including maximum colour range within each specified colour), sheen, tone, texture, range of blemishes and other markings. Where colour, pattern or texture is criterion, submit full range of samples.
- .3 Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .4 Contractor may be asked to remove and discard Products for which samples have not been reviewed and accepted by Consultant.
- .5 Colours:
 - .1 Where not specified in technical Specifications, Consultant will select colours and gloss value from manufacturers' standard range after Contract Award.
 - .2 Obtain direction on colours and gloss values in advance of need. If requested, submit samples for colour and gloss selection.
 - .3 Follow colour schedule provided by Consultant and use colours and glosses designated.

1.15 INFORMATIONAL AND OTHER MISCELLANEOUS SUBMITTALS

- .1 When required by Contract Documents, submit informational and miscellaneous submittals required by Contract Documents (e.g. plans, reports, certifications, results, records, and similar submittals) for Consultant's review.
- .2 Test Reports:
 - .1 Submit test reports in accordance with requirements of specification Sections and as requested by Consultant.
 - .2 Reports must be signed by authorized official of testing laboratory and indicate that material, Product or system is identical to material, Product or system to be provided for Project, and has been tested in accordance with specified requirements.
 - .3 Testing must have been within three years of date of Contract award.
- .3 Certificates:
 - .1 Submit certificates in accordance with requirements of specification Sections and as requested by Consultant.

- .2 Statements must be printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material, and attesting that product, system or material meets specification requirements.
- .3 Certificates must be project-specific, clearly indicated Project name, and dated after date of Contract award.

1.16 REQUESTS FOR INFORMATION OR INTERPRETATION (RFI)

- .1 Request for information or interpretation (RFI) are part of a formal process used during The Work to obtain an interpretation of the Contract Documents or to obtain additional information. RFIs shall not constitute notice of claim for a delay.
- .2 Procedure: Immediately on discovery of the need for interpretation of Contract Documents, or additional information prepare and submit an RFI in the form specified.
 - .1 RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 - .2 Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of Subcontractors or delay in the performance of The Work. Costs resulting from failure to do so will not be paid by the Owner.
 - .3 Number RFI's consecutively in one sequence in order submitted.
 - .4 Submit one distinct subject per RFI. Do not combine unrelated items on one RFI.
- .3 Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
 - .1 Project name.
 - .2 Date.
 - .3 Name of Contractor.
 - .4 Name of Consultant.
 - .5 RFI number, numbered sequentially.
 - .6 Specification Section number and title and related paragraphs, as appropriate.
 - .7 Drawing number and detail references, as appropriate.
 - .8 Field dimensions and conditions, as appropriate.
 - .9 Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Price, Contractor shall state impact in the RFI.
 - .10 Contractor's signature.
 - .11 Attachments: Include Drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
 - .1 Supplementary Drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- .4 Screening of RFIs:

- .1 Contractor shall satisfy itself that an RFI is warranted by undertaking a thorough review of the Contract Documents to determine that the claim, dispute, or other matters in question relating to the performance of The Work or the Interpretation of the Contract Documents cannot be resolved by direct reference to the Contract Documents.
- .2 Contractor shall describe in detail this review on the RFI form as part of the RFI submission. RFI submittals that lack such detailed review description, or where the detail provided is, in the opinion of the Consultant, insufficient, shall not be reviewed by the Consultant and shall be rejected. The following RFIs will be returned without action:
 - .1 Requests for approval of submittals.
 - .2 Requests for approval of substitutions.
 - .3 Requests for coordination information already indicated in the Contract Documents.
 - .4 Requests for adjustments in the Contract Time or the Contract Price.
 - .5 Incomplete RFIs or RFIs with numerous errors.
- .5 Consultant's Action: Consultant will review each RFI, determine action required, and return it. Discuss outstanding RFI items at each progress meeting. Allow Consultant reasonable time to review and respond to RFI items.
 - .1 Consultant's action may include a request for additional information, in which case the Contractor shall submit promptly.
 - .2 Consultant's action on RFIs that may result in a change to the Contract Time or the Contract Price may be eligible for Contractor to submit Change Order according to Section 01 20 00.
 - .1 If Contractor believes the RFI response warrants change in the Contract Time or the Contract Price, notify Consultant in writing within 10 Days of receipt of the RFI response.
 - .3 Consultant's response shall not be considered as a Change Order or Change Directive, nor does it authorize changes in the Contract Price or Contract Time or changes in The Work.
 - .4 Only the Consultant shall respond to RFIs. Responses to RFIs received from entities other than the Consultant shall not be considered.
- .6 On receipt of Consultant's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Consultant within 7 Days if Contractor disagrees with response.
- .7 If, at any time, the Contractor submits a large enough number of RFIs or the Consultant considers the RFI to be of such complexity that the Consultant cannot process these RFI's within 10 Working Days, the Consultant, will confer with the Contractor and the originator of the RFI within 3 Working Days of receipt of such RFIs, and the Consultant, the Contractor, and the originator will jointly prepare an estimate of the time necessary for processing RFIs as well as an order of priority among the RFIs submitted.
- .8 The Contractor and originator shall accommodate such necessary time at no increase in the Contract Time and at no additional cost to the Owner.
- .9 RFI Log:
 - .1 Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number.
 - .2 Submit updated RFI log at each biweekly meeting for discussion.

1.17 DOCUMENTS REQUIRED ON SITE

- .1 Conform Contract Conditions as amended by any Supplementary Conditions, and maintain at job site, one copy each of the following documents:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed Shop Drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Contemplated Change Orders.
 - .7 Change Orders.
 - .8 Change Directives.
 - .9 Site Instructions.
 - .10 Other Modifications to Contract.
 - .11 Field Test Reports.
 - .12 Copy of Approved Work Schedule and progress schedules.
 - .13 Health and Safety Plan and Other Safety Related Documents.
 - .14 Manufacturer's installation and application instructions.
 - .15 Progress photographs.
 - .16 As-Built Drawings.
 - .17 Minutes of site meetings.

1.18 PRODUCT SUBSTITUTION PROPOSALS

- .1 Refer to Section 01 25 00, Substitution Procedures

1.19 CLOSEOUT SUBMITTALS

- .1 Refer to Section 01 77 00, Closeout Procedures for specified requirements.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* alterations and repairs to *The Work* indicated on or inferable from the *Contract Documents* including but not limited to following items:
 - .1 existing fire-rated and non fire-rated partitions
 - .2 existing doors and frames,
 - .3 existing flooring.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Planning, Scheduling & Coordination of Alterations:
 - .1 Plan and schedule alterations to accommodate anticipated difficulties, indicated on and inferable from the *Contract Documents*.
 - .2 Plan, schedule and coordinate alterations to accommodate on-going operations of *Owner* with minimal disruption.
 - .3 Plan, schedule and coordinate alterations, required in *Owner*-occupied spaces or adjoining or below the *Place of The Work*, on a room-by-room basis and in accordance with a schedule mutually agreed upon with *Owner*. Requests for access to occupied areas shall be made to *Owner* a minimum of 5 days in advance of requested access time.
 - .4 Co-ordinate alterations with other *Contractors* and proceed with work expeditiously.
 - .5 Perform work in a manner such as to cause a minimum of noise and interference to use of existing premises and services. *Provide* maximum safety for occupants during work.
 - .6 If unscheduled disturbance to use of existing premises and services is required to complete work, inform *Owner* with advance. *Provide* information of requirements and perform work at times directed by *Owner*.
 - .7 Properly coordinate work of various Sections and trades. Take into consideration existing installations to ensure best arrangement of pipes, conduits, ducts and mechanical, electrical and other equipment and items, in available space. Under no circumstances will any extra payment be allowed due to failure by *Contractor* to take into consideration existing installations and to coordinate work.

- .8 Cutting, patching and making good existing work to accommodate new work and requirements specified under other Sections shall be done in conjunction with work specified herein.

1.5 QUALITY ASSURANCE

- .1 Qualifications: *Provide* work of this Section executed by competent installers with minimum 5 years' experience and skilled in the trade being performed. Demonstrate experience of *Projects* of similar scope and size, and evidence of a continuing quality assurance program for both materials and installation crews.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- .1 Design and Performance Requirements:
- .1 *Provide Products*, materials, construction, workmanship and finish to match existing unless indicated otherwise.
 - .2 Perform remodeling, alteration, demolition, cutting, patching, removal, refinishing, relocation, and disposal work in accordance with local health and safety standards, codes, ordinances, and *Owner* Policies. Where conflicts occur, comply with the more restrictive requirements.
 - .3 Perform remodeling, alteration, demolition, cutting, patching, removal, refinishing, and relocation work in such a manner as to preserve aesthetic and structural integrity of materials and construction.
 - .4 Should *Contractor* determine that existing penetrations cannot be sealed due to accessibility, constructability or any other condition, notify *Consultant* in writing and obtain clear direction to proceed prior to any installation of Work.
 - .5 Work shown on *Drawings*, Schedules and *Specifications* may not be all work required to be done in existing building. *Make Good* and execute all necessary work to complete alterations work.
 - .6 General Material Requirements:
 - .1 Where *Specification* requirements include design of a *Product* or system, and minimum material requirements are specified, design of such *Product* or system shall employ materials specified within applicable Section.
 - .2 Where materials or components are not specified herein, except where matching existing construction, *Provide* materials as specified elsewhere in *Specifications*.
 - .3 Where materials are not specified elsewhere in *Specifications*, *Contractor* may augment materials with those of its choice within applicable Code limitations while maintaining integrity of design and architectural requirements.
 - .7 Ensure new materials used to repair damage are compatible with existing work. Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes and primers.
 - .8 Defective *Products*: whenever identified prior to completion of alterations and repair work, will be rejected, regardless of previous reviews. Reviews do not relieve *Contractor* of its responsibilities, but are precautions against oversights or errors. Remove and replace defective and/or damaged *Products* at own expense and be responsible for delays and expenses caused by rejection.
 - .9 Relocate or store salvage items noted on *Drawings* or designated on site.

2.2 MATERIALS

.1 Self-Levelling Topping:

.1 Cementitious Self-Leveling Poured Floor Underlayment: *Provide* 1 of following in accordance with manufacturer's recommendations for following:

- .1 0 - 9 mm (0" - 3/8") thickness: 7000 psi, thin topping self levelling floor underlayment for topping concrete or precast. *Provide* "Level-Right FS 10" by Maxxon Canada or "MAPEI Novaplan 2" by Mapei or approved equivalent by Ardex Engineered Cements.
- .2 0 - 38 mm (0" - 1-1/2"), up to 7000 psi, thick self levelling floor underlayment for unlevelled concrete or precast. *Provide* "Level-Right Plus" by Maxxon Canada or "MAPEI Ultraplan 1 plus " by Mapei or approved equivalent by Ardex Engineered Cements.
- .3 Cement-Based Topping: Self-leveling for resurfacing interior concrete to *Provide* level and smooth floors areas requiring a hard, smooth, flat concrete surface. *Provide* "Level-Right WearTop" by Maxxon or "MAPEI M20" by Mapei or approved equivalent by Ardex Engineered Cements.

.2 Screed mortars:

- .1 "Topcem Premix with Planigrout AC," Accelerated Cure thick bed Screed and additive by Mapei Inc.
- .2 "Flextile FS Screed" by Flextile Ltd or "4:1 Dry Pack Mortar and Flextile #43" by Flextile Ltd.
- .3 "Laticrete 3701 Mortar Admix" and "Laticrete 226" thick bed mortar by Laticrete.
- .4 "ARDEX AM100" by Ardex Engineered Cements
- .5 "Servocret RS (fast setting - 1hr), Servocret RS-N (normal setting), non-sag, walls and floors, pumpable by Kiesel

.3 Leakproof sealants, patching compound and primer: as recommended by topping manufacturer.

.2 Resilient Tile Flooring

- .1 Resilient tile flooring: Tile matching existing in every respect, free of blisters, cracks, chipped edges and corners, embedded foreign matter and other defects which may mar its appearance and /or durability,
- .2 Resilient edge strips: Solid, colour pigmented, rubber or metal transition and adaptor edge strips to suit floor finishes and of profile as selected later by the Consultant to suit conditions,
- .3 Colour, pattern and style as supplied by *Consultant*.
- .4 Patching compounds and underlayments: Types and brands approved, acceptable to the resilient tile flooring and resilient edge strip manufacturers for the applicable conditions; Use non-shrinking latex compound.
- .5 Resilient tile flooring and edge strip adhesives: waterproof, clear setting type as recommended by the resilient flooring and edge strip manufacturer.
- .6 Cleaners, sealers and finishes: All cleaners, sealers and finishes shall be compatible with each other, from 1 manufacturer and acceptable to the *Consultant*. Do NOT use cleaners, sealers and finishes from different manufacturers.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Acceptance of Conditions:
 - .1 *Drawings* are, in part, diagrammatic and are intended to convey scope of alteration and repair work and indicate general and approximate location, arrangement and sizes of fixtures, equipment, ducts, piping, conduit and outlets and similar items. Obtain more accurate information about locations, arrangement and sizes from study and coordination of *Drawings*, including *Shop Drawings* and manufacturers' literature and become familiar with conditions and spaces affecting these matters before proceeding with work.
 - .2 Examine site at no additional cost or risk to *Owner* for all matters relating to extent of work under this Section, existing conditions including without limitations, surfaces and substrata upon which alteration and repair work depends, means of access and egress, all obstacles, rights and interests of other parties which may be interfered with during execution of alteration and repair work. *Contractor* to take into consideration all conditions and limitations in performing work, including obstructions, existing structures or facilities, local conditions, actual levels, character and nature of *Project*, and any other consideration which may affect performance of alteration and repair work.
 - .3 Where available obtain existing *Drawings* pertaining existing building layout, architectural, structural, mechanical, electrical details and assess impact in performing *The Work* of this *Contract*.
 - .4 Ensure each *Subcontractor* has full understanding of extent of its work. Report in writing defects in such work and notify *Subcontractors* responsible for unfavourable and unsatisfactory conditions. Do not commence alteration and repair work until unsatisfactory conditions have been corrected. Verify corrected work prior to commencing work. Execution and application of work shall be deemed acceptance of work of others upon which new work depends.
- .2 Existing Activities, Facilities and Conditions:
 - .1 Make arrangements and pay all costs to temporarily relocate, or in any way accommodate existing services which affect work. Should any pipingcables, or similar services be encountered during work that are not known from *Owner's* and utilities companies' records, notify *Consultant* and do not proceed with removal or cutting until directed.
 - .2 Protect and maintain in operation all existing services and systems. When removing or altering existing services, make safe, secure and maintain seals as applicable for all lines affected.

3.2 PREPARATION

- .1 Design and *Provide* shoring, bracing, and related supports to maintain integrity of structural components of *The Work*.
- .2 *Provide* protection to items adjacent to *The Work* and obtain *Consultant's* approval regarding adequacy and type of protection provided.
- .3 Throughout entire construction period, *Provide* proper and safe means of fire exit from all zones of existing building at all times, to approval of authorities having jurisdiction.
- .4 Wherever it becomes necessary to cut or interfere in any manner with existing apparatus for short periods of time, do work at such times as agreed upon with *Owner* and *Consultant*.

3.3 INSTALLATION

.1 General Requirements:

- .1 Except where specified otherwise, use each *Product* in accordance with manufacturer's published or written instructions, *Specifications* or recommendations regarding handling, storage, preparation, site conditions, ancillary *Products* or accessories, methods of installation, protection and cleaning. Submit copy of such instructions, and indicate if and where there is discrepancy between them and requirements of *Specifications* and obtain direction.
- .2 Whenever specific reference to comply with manufacturer's directions or instructions is made in *Specifications*, submit copies thereof as requested during construction for review before commencing such work.
- .3 Do work in accordance with industry practice for type of work unless *Contract Documents* stipulate more precise requirements. Do not let unskilled, incompetent workers perform work.
- .4 Do work in neat and careful manner to retain *Work* plumb, square, and straight.
- .5 Ensure work is properly related to form close joints and appropriately aligned junctions, edges and surfaces and is free of warp, twist, wind, wave or other irregularities.
- .6 When required by *Specifications* or by manufacturer's recommendations, have manufacturers', *Suppliers'* or accredited agents, inspect work which incorporates their *Products*.
- .7 Do not permit materials to come in contact with other materials whether in presence of moisture or otherwise if conditions will result in corrosion, stain or discolouration or deterioration of completed work. *Provide* compatible, durable separators where such contact is unavoidable.
- .8 Load no part of structure during construction with load greater than it is calculated to bear safely when completed. Make every temporary support as strong as permanent support. Place no load on concrete structure until it has sufficient strength to safely carry such load.
- .9 Conceal pipes, ducts, conduits, tubing, wiring and other items requiring concealment in floor, wall and ceiling construction of finished areas except where indicated or specified otherwise. If in doubt as to method of concealment, or intention of *Contract Documents* in this connection, request clarification from *Consultant* before proceeding with work in question.
- .10 *Install* and arrange fixtures, equipment, ducts, piping and conduit to conserve as much headroom and space as possible, and avoid interference and obstruction of access. Observe good installation practice for safety, access, maintenance and follow manufacturer's recommendations. Location of fixtures, access panels, outlets and mechanical and electrical components indicated are approximate. Make changes requested to comply with these requirements at no additional cost to *Owner*.
- .11 If requested by *Consultant*, and before their installation, relocate equipment, services, doors, openings, furring and other work at no additional cost to *Owner*; provided such relocation involves only reasonable minor adjustments within ± 1500 mm (5' - 0") horizontally or vertically and reasonable advance notice is given in writing. Ensure identification of electrical and mechanical system installations and other automated systems or equipment shall be provided in accordance with *Contract Documents*.

- .12 Make provisions to join new work to existing and to install new supporting members, anchors and other items necessary for completion of work. *Provide* temporary bracing where required.
- .13 Lay out mechanical and electrical work in advance of concrete placement and furring installation to allow for its proper concealment.
- .14 Test and inspect work before applying pipe covering and before *Work* is concealed.
- .15 Remove, store and reinstall existing fixed equipment, fixtures and components which interfere with construction work.

3.4 REMOVAL OF EXISTING CONSTRUCTION

.1 General Requirements:

- .1 Ensure all demolition and removal work conforms to CSA S350.
- .2 Remove selected building components from locations indicated on *Drawings* and/or as directed by *Owner*. Remove carefully items designated to be re-used or to be handed over to *Owner*. Storage location may be in same building or at location away from the *Place of The Work*.
- .3 Demolition and removal involves existing partitions, existing vinyl resilient floor and similar components as indicated on *Drawings*.
- .4 Do not stack or pile materials and/or debris in building to extent that it will create obstruction or hazards to building and occupants thereof.
- .5 At the end of each work session, leave selective demolition work in safe conditions.
- .6 Conceal piping, duct, conduit and other service alterations in ceilings, walls and furred spaces if possible.
- .7 Remove demolition material in covered container or double bags when construction area is in vicinity of patient care areas and at time of day when there is minimal corridor traffic.
- .8 Do not locate demolition storage bin adjacent to air intake HVAC units;
- .9 Seal any openings in perimeter wall of construction site to prevent air from adjacent area to enter construction zone as addition volume of air will change pressurization.

.2 Services:

- .1 Where permanently disconnecting domestic water, medical vacuum, medical gas, natural gas, treated water, drainage, vent, or other piping serving removed fixtures, inlets, outlets or equipment, remove all associated piping back to remaining active mains.
- .2 Cut off, cap, divert or remove existing services in areas being altered which are affected by changes as required or as directed by municipal authorities and utility company concerned and *Consultant*. Protect and maintain active services to existing building.
- .3 Protect active services which are intended to remain and which pass through spaces involved in alterations and repairs.
- .4 Refer to *Drawings* for removal, capping, and alterations to conduit, wiring, fixtures, ducts, piping and other service lines.

.3 Floor Drains:

- .1 Ensure existing floor drains that will not remain in service after Project completion are isolated from the remaining active building drainage and vent system. Seal floor drain bodies remaining within slabs watertight. Remove all associated piping serving decommissioned floor drains located in suspended slabs back to remaining active mains.

3.5 CUTTING AND PATCHING

.1 General Requirements:

- .1 Coordinate cutting, patching and openings with *Subcontractors* to avoid unnecessary and unscheduled cutting and patching work. Join new work to existing in neat, accurate manner. *Provide* sound attenuation fillers at interior junctions with other building components.
- .2 Execute cutting neatly and carefully, no larger than necessary, employing workers skilled in erection of the part of work being cut. Patch parts of *The Work* to match adjacent construction and finishes unless otherwise specified or indicated on *Drawings*. Make patching blend in final assembly *Work*.
- .3 *Provide* patching to fit tightly all construction pipes, ducts and conduits which pass through work and ensure air tightness.
- .4 Design and *Provide*, as directed by *the Consultant*, permanent and temporary reinforcement and supports.
- .5 Maintain fire separations and *Provide* fire and smoke penetration sealants in cut and patched parts of work.
- .6 Unless otherwise indicated, run piping, ducts and conduit in ceilings and furred spaces. Bury conduit in walls.
- .7 Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform for purpose intended or that results in increased maintenance or decreased operational and life safety. Operating elements include without limitation, primary operational systems and equipment, air and smoke barriers, fire suppressions systems, mechanical systems including piping and ducts, control, communication, conveying and electrical wiring and special operating systems.
- .8 Do not cut and patch miscellaneous elements or related components that could change their loading capacity that results in increased maintenance or decreased operational and life safety. Miscellaneous elements include without limitation, water, moisture, air/vapour barriers, membranes and flashings, exterior curtain wall system, equipment supports, piping, ductwork, vessels and equipment, noise and vibration control elements and systems.
- .9 Do not cut and patch construction in manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on exterior or in occupied spaces in a manner that would, in *Consultant's* opinion reduce aesthetic qualities. Remove and replace construction that has been cut and patched in visually unsatisfactory manner.
- .10 Where new work connects with existing and where existing work is altered, perform necessary cutting and fitting required to make satisfactory connections with existing work, so as to leave entire alteration and repair work in a finished condition. Match new work exactly with existing work in material, form, construction and finish unless otherwise noted or specified. Make joining work inconspicuous.
- .11 Make cuts clean and true with smooth edges. Fit units to tolerances established by existing work and in conformance with best standard practice for applicable class of work.
- .12 *Make Good* materials, surfaces, and finishes damaged or disturbed.
- .13 Fill unused and unfilled sleeves and holes in non-fire rated floors and partitions not otherwise filled, by approved means. If unused sleeve is in fire or sound barrier, fill in manner to restore or maintain fire or sound barrier rating. Filling of openings in fire rated floors and partitions specified under Section 07 84 00.

- .14 If non-designated and unclassified sprayed fire resisting, sound absorbing, or insulation applications are encountered, inform *Consultant* for examination and instructions. Restore damaged non-asbestos type fireproofing to original condition before covering with finishes.
- .15 Repair adjacent construction and surfaces which are damaged or disturbed as a result of alterations.
- .2 Fire Separation Alterations:
 - .1 Maintain fire separations for duration of work of this Section. *Provide* fire and smoke penetration sealants at alterations and repairs in accordance with Section 07 84 00.
 - .2 *Provide* fire and smoke penetration sealants to properly seal pipes, sleeves, ducts, conduit and other penetrations through surfaces.
 - .3 *Provide* continuous and solid framing, blocking or masonry work around service penetrations through fire separations in accordance with the fire penetration sealant design to maintain the continuity of the fire separation.
- .3 Cutting and Patching for Mechanical, Electrical and other Miscellaneous Alterations:
 - .1 Removal of existing ceilings and removal, cutting, and patching and replacement of existing walls and floors as may be necessary for access to valves, piping, conduit, and tubing by mechanical and electrical trades.
 - .2 *Provide* cutting and patching required for access to execute services alterations. Conceal capped services unless specifically indicated to remain exposed. Patch to conceal altered and capped services.
 - .3 Cutting and patching shall be located and paid for by *Subcontractors* requiring work performed for their installations. Work shall be performed under direct supervision of *Contractor*.
 - .4 Mechanical and electrical alterations and repair work may be outside of areas anticipated for architectural renovations. Ensure *Contract Price* includes cutting, patching, repair and alterations beyond site limits indicated for *The Work*. *Subcontractors* requiring work to be performed for their installations shall include for all removals, repair, alterations and reinstallations as necessary to complete their work.
- .4 Resilient Flooring:
 - .1 Cutting and Removal: Remove in whole units to natural breaking points and/or straight joint lines with no damaged or defective existing tiles remaining where joining new construction. Conform to Resilient Floor Covering Institute RFCI IP #1, Recommended Installation Practice; www.rfci.com
 - .1 Remove existing flooring and bases where indicated unless specified to be carried out under other Sections. Remove flooring and adhesive/setting bed materials completely, down to concrete substrate. Prepare, mix and apply coats to neutralize residues adhesives and setting beds and to *Provide* suitable substrate to receive scheduled flooring in accordance with manufacturer's instructions.
 - .2 Resilient flooring may contain asbestos fibers and crystalline silica therefore do not sand, dry sweep, dry scrape, drill, saw, beadblast or mechanically chip or pulverize existing resilient flooring, backing, lining felt, asphaltic "cutback" adhesive or other adhesive. Avoid creating dust. Inhalation of dust may cause respiratory tract and other health hazard.

- .3 Prepare existing surface acceptable to *Consultant*, suitable and compatible with subsequent applied underlayment or applied finish. If required, *Provide* damproof coating or moisture reduction barrier.
- .2 Patching and New Installation:
 - .1 Prepare subfloors to receive resilient tile flooring in accordance with ASTM F710 and the manufacturer's written recommendations.
 - .2 Fill cracks, holes and other defects with cementitious patching compound. Trowel patching compound smooth and level with surrounding surfaces and allow to dry and set. Prohibit traffic until the patching compound cures.
 - .3 Where resilient flooring adjoins thicker floor materials, apply underlayment, feathered out to make up difference in level between *Products*.
 - .4 *Provide* resilient flooring in accordance with the manufacturer's printed installation instructions using recommended adhesive. *Provide Products* in each area from the same production run. Accurately scribe flooring materials around walls, columns, floor outlets and other floor penetrations. Pattern shall match existing resilient tile flooring.
 - .5 In areas where there is built-in millwork or fitments, lay flooring full lengths and widths of areas disregarding locations of millwork or fitments.
 - .6 Terminate flooring at centre line of door in openings where adjacent floor finish or colour is dissimilar.
 - .7 *Install* resilient edge strips in accordance with the manufacturer's printed installation instructions using specified adhesive, with continuous coating of adhesive, tight joints and proper alignment. *Install* resilient edge strips in longest lengths possible, with neatly mitred corners. *Install* resilient edge strips at unprotected edges of resilient tile flooring. At door openings, *Install* resilient edge strips below centre line of door.
 - .8 Remove and replace loose, damaged and defective resilient tile flooring where required and as directed by *Consultant*.
 - .9 Protect newly laid resilient tile flooring from construction traffic for a period of 2 weeks to allow flooring to bond firmly. At the end of this time, scrub clean with cleaner, and apply sealer and finish in accordance with the manufacturer's instructions.
 - .10 Work shall be handed over to *Owner* free of blemishes and in perfect condition.
- .5 Gypsum and Plaster Partitions:
 - .1 Where walls or partitions that are removed extend one finished area into another, patch and repair wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - .2 Patching:
 - .1 Patch and repair existing gypsum finishes with new finishes to match, where mechanical and electrical and architectural *Work* of this *Contract* penetrate existing finishes as specified herein. *Install* plaster in accordance with ASTM C840 Gypsum Finishes and manufacturer's written instructions.
 - .2 Perform patch and repair of existing gypsum finishes by *Subcontractor* having continuous experience in successful installation of plaster *Work* type and quality as specified herein.

- .3 *Provide* ventilation to properly dry finished surfaces during and subsequent to installation. In enclosed areas lacking proper ventilation and air circulation, *Provide* additional temporary, portable mechanical ventilation to remove moisture laden air in plastering area as fast as possible.
 - .4 Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. *Provide* additional coats until patch blends with adjacent surfaces as approved by *Consultant*.
- .6 Temporary Ceiling Removal:
- .1 Coordinate with electrical, IT, security and mechanical trades to assess complete scope of temporary ceiling removals to allow for feeder runs and the like by those Sections (extent of ceiling removal has not been shown on *Drawings*).
 - .2 *Provide* temporary protection, signage and barriers to protect others.
 - .3 Remove tile, panels and tee bar suspension from area required by other trades.
 - .4 Upon completion of work of other trades and all required inspections, replace tee-bar and acoustic tile. Where tile or tee-bar are damaged, bent, discoloured, scratched or otherwise appear of lesser quality than surrounding area, replace with new material.
 - .5 Plaster ceilings in existing building may have a fire resistance rating and be forming part of a membrane fire separation. Verify and maintain existing fire rating.
 - .6 Remove and replace gypsum board bulkheads and ceilings in areas designated and as required. *Make Good* and match existing finishes.
- .7 Woodwork:
- .1 Cutting: Cut back to a joint or panel line.
 - .2 Patch as required. Remove and replace millwork with new in accordance with 06 40 00.
- .8 Existing Doors, Frames, and Sash:
- .1 Cutting and Removal: Remove in such manner as to facilitate filling in of openings or installation of new work, as required by *Drawings*.
 - .2 Modify existing steel door frames with cutouts, hardware blanking, reinforcing, tapping and drilling arrangements, repairs to accommodate new doors and other preparations;
 - .3 Grind exposed welds smooth and flush. Fill open joints, seams and depressions with filler or by continuous brazing or welding. Grind smooth to true sharp arises and profiles and sand down to smooth, true, uniform finish. Welding: CSA W59-M.
 - .4 Where existing frame required replacement:
 - .1 Fabricate frames to match existing in every respect; Reinforce frame as required for surface mounted hardware.
 - .2 Where frames occur in masonry *Provide* strip strap, T-strap or wire type anchors. Where frames occur in gypsum board *Provide* stud type anchors.
 - .3 Mitre corners of frames. Cut frame mitres accurately and weld continuously on inside of frame .Protect mortise cut outs with mortar guard boxes.
 - .4 Factory apply touch-up primer to areas where zinc coating has been removed during fabrication.
- .9 Painting and Finishing:

- .1 Prepare patched areas as required for new work. Wash areas to be repainted with neutral soap or detergent, thoroughly rinse, and sand when dry. Feather remaining paint edges smooth with sandpaper.
- .2 Conform to the applicable provisions of Painting Section. Prepare and build up bare areas and patches in existing painted surfaces with proper primer and intermediate coats, sand smooth and flush with adjoining surfaces. Paint all areas scheduled to be painted and/or repainted as specified in Painting Section of the *Specifications*.

3.6 PROTECTION

- .1 During performance of work, adequately protect work completed and in progress, and existing work to remain, such as floors, finishes, trim, and similar components, as completely as possible to minimize replacement of damaged work by each *Subcontractor* and trade. Work damaged or defaced due to failure to *Provide* adequate protection shall be repaired, or removed and replaced as directed by *Consultant*.
- .2 Protect active services which are intended to remain and which pass through spaces involved in alterations and repairs.

3.7 CLEANING AND RESTORATION

- .1 Disposal of Debris:
 - .1 Clean up all material, debris, and rubbish resulting from remodeling work, remove from the building and Site, and legally dispose of. Leave all areas of work in "broom clean" condition.
 - .2 All debris shall be transported out of the building in covered carts with no materials extending above the cart rim.
- .2 *Make Good* surfaces and finishes damaged or disturbed due to *The Work* to match existing. Ensure materials used to repair damage are compatible with existing.
- .3 Restore site to condition equal to or, if specified elsewhere, better than existing conditions.
- .4 Restore areas outside of limits of *The Work* which are disturbed to original conditions in addition to complying with requirements of *Contract Documents*.

END OF SECTION

PART 1 - GENERAL

1.1 CODES

- .1 Perform Work in accordance with the 2012 Ontario Building Code (or OBC or Building Code) - O. Reg. 332/12 under Building Code Act, 1992 including amendments up to Bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, the most stringent requirements apply.
- .2 Specific design and performance requirements listed in specifications or indicated on Drawings may exceed minimum requirements established by referenced Building Code; these requirements will govern over the minimum requirements listed in Building Code
- .3 Where OBC or Contract Documents do not cover a specific requirement, which is covered by the National Building Code of Canada, latest edition (or NBC), conform to requirements of NBC including its related supplements.
- .4 Where Specifications do not provide sufficient details for a particular item of work indicated on Drawings or Schedules, conform to minimum standards indicated in the OBC, and in the absence of more restrictive requirements comply with specifications, installation methods, and standards of workmanship indicated in OBC, Part 9 "Housing and Small Buildings".

1.2 LAWS

- .1 Comply with Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.0.1, as amended and O. Reg. 213/91 as amended.
- .2 Conform to hours of Work, rates of wages paid, terms of employment and Working conditions in accordance with prevailing wages at the Place of the Work. Comply with requirements of the Place of the Work's workplace compensation board , including any payments due thereunder.
- .3 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Consultant.

1.3 PERMITS

- .1 Consultant has, on Owner's behalf, applied for building permit. Building permit fee has been paid by Owner. Contractor shall display building permit and other permits in a conspicuous location at Place of Work.
- .2 Except as otherwise specified in this Section, Contractor shall apply for, obtain, and pay fees associated with other permits, licenses, certificates, inspections and approvals required by regulatory requirements and Contract Documents.
- .3 Ensure permits, licenses and certificates included under specific Sections are provided as specified. Forward copies of permits to Owner and Consultant before commencing Work

1.4 REFERENCE STANDARDS

- .1 Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- .2 Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.

- .3 Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.5 PRE-START HEALTH AND SAFETY REVIEW (PSR)

- .1 Ensure lifting devices, material handling equipment, manlifts and elevating rolling work platforms provided as work of this Contract comply with the requirements of the Occupational Health and Safety Act (Ontario), Regulation 851, as amended.
- .2 For guidance, refer to latest edition of “Guidelines for Pre-Start Health and Safety Reviews: How to Apply Section 7 of the Regulation for Industrial Establishments” published by the Government of Ontario.
- .3 Ensure all exemption documents or PSR reports are complete and correct prior to handing over to Owner. Submit three sets of original documents to Owner for approval.

1.6 MINIMUM QUALIFICATION REQUIREMENTS

- .1 Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- .2 Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. Procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements. Unless specifically indicated otherwise in Contract Documents, manufacturer must have a minimum of 10 years’ experience in production of specified systems.
- .3 Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. Unless specifically indicated otherwise in Contract Documents, fabricator must have a minimum of 10 years’ experience in production of specified systems.
- .4 Welder Qualifications: A firm experienced in welding activities and certified in accordance with CSA W47.1 and CSA W59-M with minimum certification level equal to “Division 1” or “Division 2”.
 - .1 Operators employed on the project must be qualified per CSA W47.1 for work required by Contract Documents with minimum certification level equal to “Class O”.
 - .2 Welding inspectors and supervisors employed on the project must meet qualifications of CSA W178.1 and CSA W178.2 and be certified by the Canadian Welding Bureau for “Category (a), Buildings”.
 - .3 Submit copies of welding certificates to Consultant prior to start of the Work.
- .5 Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance. Unless specifically indicated otherwise in Contract Documents, manufacturer must have a minimum of 5 years’ experience in installation of specified systems, and where applicable, be certified by manufacturer.

- .6 Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project. Professional Engineer must carry professional liability insurance of not less than \$2,000,000.00. Professional Engineers who opt for “Mandatory Disclosure” or “Suggested Disclosure” approaches are not permitted to be employed for this Project.
- .7 Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.7 PROFESSIONAL ENGINEER’S SERVICE

- .1 Drawings and details are diagrammatic in nature, and are intended to show design concept, aesthetics, interfacing requirements, configuration, and arrangement. They are not intended to identify or solve completely problems of thermal and structural movements, assembly framing, engineering design, fixings and anchorages.
- .2 Employ a professional engineer to size additional supports, anchorages, and bracing as may be required to support loads and stresses to ensure a safe and secure installation. Provide such additional supports, anchorages, and bracing at no additional cost to Owner.
- .3 Where required by Contract Documents or by authorities having jurisdiction, retain the services of a Professional Engineer registered or licensed in Province of Ontario to perform the following activities as applicable:
 - .1 Design components of The Work requiring structural, or other engineering performance,
 - .2 Determine specific requirements for assemblies, connections, sizes, joint spacing and similar requirements.
 - .3 Produce, review, stamp and sign Shop Drawings.
 - .4 Inspect components of The Work during fabrication and erection.
 - .5 Perform field review of installations including, but not limited to, inspection and testing of welded and bolted connections for conformity to design requirements, inspection of fabricated and erected members against specified member shapes, inspection of stiffeners and bridging, inspection of field cutting and alterations required for the work;
 - .6 Submit field reports within three days of site visits to Consultant, Owner and authorities having jurisdiction covering work inspected with details of deficiencies discovered.
- .4 Where professional engineering services or certifications by a Professional Engineer are specifically required of Contractor by the Contract Documents, comply with specific performance and design criteria indicated. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Consultant.
 - .1 Submit statement from Professional Engineer indicating that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.8 FIELD SAMPLES AND MOCKUPS

- .1 Provide all Mock-ups required by Contract Documents. Mock-ups shall serve to establish a standard for remaining parts of the Work.

- .2 Before installing portions of the Work requiring mock-ups, construct mock-ups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work
- .3 Prior to manufacture and delivery of Products, arrange for Consultant's and Owner's review and acceptance of mock-ups. Expect changes to Mock-ups to be made. Allow time for modifications and subsequent reviews.
- .4 Failure to obtain review and acceptance of Mock-ups in ample time will not be considered sufficient reason for extensions to Contract Time or for extra costs.
- .5 Promptly correct unsatisfactory conditions noted by Consultant and modify Mock-ups in accordance with Consultant's review at no additional cost to Owner. Mock-up review and revisions will not be accepted as basis of claim for delay or additional cost.
- .6 Assist Consultant in preparing a schedule fixing the dates for mock-up review. Notify Consultant 10 working days in advance of dates and times when mock-ups will be constructed.
- .7 Provide Mock-ups using personnel assigned to work, materials and techniques to be used on the Work.
- .8 Refer to each Section of the Work for additional information of Mock-up requirements.
- .9 Construct mock-ups of size indicated or, if not indicated, as directed by Consultant.
- .10 Construct mock-ups in location indicated or, if not indicated, as directed by Consultant.
- .11 Demonstrate the proposed range of aesthetic effects and workmanship.
- .12 Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed Work.
- .13 Review of mock-ups by the Consultant does not constitute approval of deviations from the Contract Documents contained in mock-ups unless Consultant specifically approves such deviations in writing.
- .14 Types of Mock-ups as required by Specification Sections:
 - .1 Transportable Mock-Ups. Refer to Sections for size requirements. Arrange and pay for delivery and pick-up.
 - .2 Site Mock-Ups: Refer to Sections to determine if mock-ups will form part of Work or are built separately. Demolish mock-ups built separately after Work of applicable Section is completed and Consultant has reviewed that part of Work. Obtain Consultant's acceptance of location of site mock-ups.

1.9 QUALITY CONTROL

- .1 Prior to commencement of the Work, establish quality control system protocols, rules, related chain of commands and commitment to provide quality work as intended in Contract Documents for the Work.
- .2 Retain services of quality control staff, shop and field supervisors complete with their skills, knowledge, duties, and responsibilities. Upon request provide full resume of supervisors showing their qualifications
- .3 Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with specified requirements.

- .4 Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction or by Building Code. Perform quality-control services required of Contractor by authorities having jurisdiction or by Building Code, whether specified or not. Submit copies of written report directly to authorities having jurisdiction, when they so direct.
- .5 Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
- .6 **Manufacturer's Field Services:** Where indicated in Contract Documents, engage manufacturer's technical service representative to observe and inspect the Work. Manufacturer's field services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Subcontractor's activities, inspection of completed portions of the Work, and submittal of written reports. Report results in writing as specified in Section 01 30 00.

1.10 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good adjacent work damaged by such removals or replacements promptly.
- .3 If in opinion of Consultant or Owner, it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 REFERENCES

- .1 Applicability of Standards:
 - .1 Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
 - .2 Where reference is made to the Code, Specification standards, manuals, Contract forms, installation, application and maintenance instructions, produced by various organizations, conform to edition specified or, if not specified, to latest edition as amended and revised as at date of the Contract.
 - .3 Where Standards designate authorities such as "Engineer", "Owner" "Purchaser" or such similar designation, these designations shall be taken to mean "Consultant" as defined in Document 00 73 00.
- .2 Publication Dates: Comply with standards in effect as of bid closing date of the Contract Documents unless otherwise indicated. Amendments to reference documents after date of Contract affecting Contract Price shall be dealt with in accordance with Part 6, Changes in The Work of General Conditions of the Stipulated Price Contract.
- .3 Copies of Standards:
 - .1 Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. If requested Provide copy on site of such standard(s).
 - .2 Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

Abbreviation	Definition
A/C	Air Conditioning
AB	Air Barrier
AC	Alternating Current
ACM	Prefomed Aluminum Composite Panels
ACP	Acoustic Ceiling Panel
ACT	Acoustic Ceiling Tile
ACT-WD	Acoustic Ceiling Wood Panel
ACT-LUM	Acoustic Ceiling Tile – Luminous
AD	Access Door
ADJ	Adjustable
AEGL	Acid-etched Glass

Abbreviation	Definition
AFF	Above Finished Floor
AFL	Access Flooring
AHC	Architectural Hardware Consultant
ALUM	Aluminum
ANOD	Anodized
AP	Alarm Panel
APP	Atactic Polypropylene
APPROX	Approximate
ARCH	Architectural
ARGB	Abuse Resistant Gypsum Board
ASM	Air Seal Membrane
ASPH	Asphalt Paving
AVB	Air/Vapour Barrier
AWG	American Wire Gage
AWP	Acoustic Wall Panel
BCS	Baby Change Station
BD	Board
BGL	Back Painted Glass
BH	Bore Hole
BL	Bed Locator
BLDG	Building
BLKG	Blocking
BM	Beam
BMK	Bench Mark
BN	Bull Nose
BOL	Bollard
BR	Bullet Resistant
B-RLG	Bumper Railing
B-ROD	Backer Rod
BS	Both Sides
BSMT	Basement
BULK	Bulkhead
BUR	Built Up Roofing
C/C	Contractor Supplied, Contractor Installed.
C/W	Complete With
CABT	Cabinet
CADA	Cash Allowance Disbursement Authorization
CB	Catch Basin
CBU	Cementitious Backer Unit
CC	Centre To Centre.
CCTR	Cubicle Curtain Track
CCTR-S	Safety (Collapsible) Cubicle Curtain Track
CEM	Cement
CEM-BD	Cement Board
CEM-PL	Cement Plaster
CFM	Cubic Feet Per Minute
CG	Corner Guard
CGL	Clear Glass (Tempered)
CH	Coat Hook
CHK-BD	Chalk Board
CHK-PL	Checkered Plate

Abbreviation	Definition
CH-S	Clothing Hook Safety
CI	Cast Iron
CID	Commercial Item Descriptions
CJ	Control Joint
CL	Centreline
CLG	Ceiling
CLR	Clear Finish
CLT	Closet
CMU	Concrete Masonry Unit
CMU-A	Architectural Concrete Masonry Unit
CMU-AC	Acoustic Concrete Masonry Unit
CO	Clean Out
COL	Column
CONC	Concrete
CONC-C	Coloured Concrete
CONC-H	Hardened Concrete
CONC-P	Precast Concrete
CONC-ST	Stained Hardened Concrete
CONSTR	Construction
CONT	Continuous
CORR	Corridor
CPT	Carpet
CPTT	Carpet Tile
CPVC	Chlorinated Polyvinyl Chloride Pipe
C-RLG	Chair Railing
CSK	Countersunk
CT	Ceramic Tile
CUPBD	Cupboard
CW	Curtain Wall
DCOF	Dynamic Coefficient of Friction
DEPT	Department
DET	Detail
DF	Drinking Fountain
DFT	Dry Film Thickness
DG	Double Glazed Unit
DGL	Decorative Glazing
DIA	Diameter
DIM	Dimension
DIV	Division
DK	Deck
DN	Down
DP	Damp-Proofing
DPC	Damp-Proof Course
DWG	Drawing
EC	Epoxy Coating
ECR	Epoxy Coating Reinforced
EHD	Electric Hand Dryer
EIFS	Exterior Insulation And Finish System
EJ	Expansion Joint
EJC	Expansion Joint Cover
ELA	Equivalent Leakage Air

Abbreviation	Definition
ELEC	Electric
ELEV	Elevation
EMERG	Emergency
EMT	Electrical Metallic Tubing
ENAM	Enamel
ENCL	Enclosure
ENT	Entry
EP	Electrical Panel
EPDM	Ethylene Propylene Diene Monomer
EPS	Expanded Polystyrene
EQUIP	Equipment
EXIST	Existing
EXP	Exposed Structure
EXT	Exterior
FA	Fire Alarm
FBD	Fibreboard
FBT	Finish Blowing Temperature
FC	Flexible Coating
FD	Floor Drain
FE	Fire Extinguisher
FEC	Fire Extinguishing Cabinet
FG	Foot Grille
FGB	Fiberglass Batt
FH	Flathead
FHC	Fire Hose Cabinet
FIN	Finished
FIXT	Fixture
FL	Floor
FOB	Freight On Board
FP	Fireproofing
FRGLC	Fire Rated Glass Ceramic
FRGLI	Intumscent Fire Rated Glass
FRL	Fiberglass Reinforced Laminate
FR-MDF	Fire-Rated Medium Density Fibreboard Core
FRP	Fiberglass Reinforced Plastic
FRSS	Flushing Rim Service Sink
FRT	Fire Retardant Treatments
FS	Firestopping
FT	Fully Tempered
FTG	Footing
FWP	Fiberglass Wall Protection
FXD	Fixed
GALV	Galvanized
GASK	Gasket
GAV	Granular Air Vents
GB	Gypsum Board
GBH	Glove Box Holder
GB-V	Vinyl-Faced Gypsum Board
GCB	Glazed Concrete Block
GFCI	Ground Fault Circuit Interrupter
GFI	Ground Fault Interrupter

Abbreviation	Definition
GFRG	Glass Fibre Reinforced Gypsum
GIS	Guarantee and Inspection Service
GL	Glass/Glazing
GL-BLK	Glass Block
GRAN-A	Granular A
GRAN-B	Granular B
GRB	Grab Bar
GRD	Ground
GRG	Fiberglass-Reinforced Gypsum
GRL	Grille
GRT	Grout
GT	Glass Tile
GWG	Georgian Wired Glass
HB	Hose Bib
HC	Hollow Core
HCH	Handicapped Clothing Hook
H-CONV	Heating Convector
HDBD	Hardboard
HGL	Heat Absorbing Glass
HM	Hollow Metal (Doors)
HORIZ	Horizontal
HP	Hydro Pole
HPC	High Performance Coating
HPDL	High-Pressure Decorative Laminates
H-RLG	Hand Railing
HS	Heat Strengthened
HSD	Hand Sanitizer Dispenser
HSGL	Heat Strengthened Glass
HSS	Hollow Structural Steel
HT	Height
HVAC	Heating, Ventilation, and Air Conditioning
HWB	Hand Wash Basin
HWP	Hygienic Wall Panels
IAQ	Indoor Air Quality
ICF	Insulated Concrete Form
ICU	Intensive Care Unit
ID	Inside Diameter
IGU	Factory Sealed Insulating Glass Units
IC	Impact Insulation Class
INCL	Including
INS	Insulation
INT	Interior
INV	Invert
IPA	Isopropyl Alcohol
IPC	Isolated Power Panel
IRGB	Impact Resistant Gypsum Board
JAN	Janitor's Closet
JST	Joist
JT	Joint
JU	Janitorial Unit

Abbreviation	Definition
KD	Knocked Down
KO	Knock Out
LAB	Laboratory
LAV	Lavatory
LED	Light Emitting Diode
LEV	Level
LGL	Laminated Glass
LH	Left Hand
LHR	Left Hand Reverse
LHS	Laminated-Heat Strengthened
LINO	Linoleum
LL	Lead Lined
LMC	Linear Metal Ceiling
LR	Light Reflectance
LS	Light Standard
LSG	Light-To-Solar Gain Ratio
LSGL	Laser Glass
LSSJ	Long Span Steel Joist
LT	Laminated-Tempered
LTTR	Long Term Thermal Resistance
LUM	Luminous
LVR	Louvre
LWD	Long Way Of Diamond
MACP	Metal Acoustic Ceiling Panel
MAT'L	Material
max	Maximum
MBG	Metal Bar Grating
MCC	Motor Control Centre
MCT	Marble Composite Tile
MDF	Medium Density Fiberboard
MDF-FR	Fire-Rated Medium Density Fiberboard
MDO	Medium Density Overlay
MECH	Mechanical
MEK	Methyl Ethyl Ketone
MET	Metal
MEZZ	Mezzanine
MH	Maintenance Hole
min	Minimum
MIR	Mirror
MIR-S	Mirror - Safety
MIR-SH	Mirror With Shelf.
MIR-T	Mirror - Tilting
misc	Miscellaneous
ML	Metal Lath
ML&PL	Metal Lath And Plaster
MO	Masonry Opening
MP	Metal Panel
MRGB	Moisture Resistant Gypsum Board
MRI	Magnetic Resonance Imaging
MRW	Mechanical Room Waterproofing

Abbreviation	Definition
MS	Metal Screen Or Metal Stair
MSCD	Motion Sensor Control Device
MSDS	Material Safety Data Sheet
MTE	Match To Existing
MVER	Moisture Vapour Emission Rate
NAFS	North American Fenestration Standard
ND	Napkin Disposal Unit
NIC	Not In Contract
NO.	Number
NOA	Notice Of Acceptance
NOM	Nominal
NRC	Noise Reduction Coefficient
NRP	Non-Removable Pin
NTS	Not To Scale
NVU	Napkin Vending Unit
'O' Panel	Fixed Panel
O.C	On Centre
O/A	Overall
O/C	On Centre
O/H	Overhead
O/O	Owner Supplied Owner Installed
OD	Outside Diameter
ODS	Ozone Depleting Substance
OGL	Obscure Glass
OITC	Outdoor Indoor Transmission Class
OPNG	Opening
OP	Operable Partition
OPP	Opposite
OWSJ	Open Web Steel Joist
P	Partition
P&D	Plumbing And Drainage
PA	Public Address System
PB	Pegboard
PCB	Polychlorinated Biphenyls
PCL	Portland Cement Lime
PDO	Power Door Operator
PE	Porcelain Enamel
PERP	Perpendicular
PETG	Polyethylene Terephthalate
PL	Plate
PLAM	Plastic Laminate
PLAM-BR	Plastic Laminate – Bullet Resistant
PLAM-LAB	Plastic Laminate – Laboratory Grade
PLAM-M	Decorative Metal Laminate
PLAM-T	Translucent Laminate
PLAS	Plaster
PLYWD	Plywood
PM	Pressed Metal
PMPC	Plasmatic Core
PNL	Panel

Abbreviation	Definition
PR	Pair
PREFAB	Prefabricated
PREFIN	Prefinished
PRV	Pressure Reducing Valves
PS	Pressed Steel Frame
PS-MAX	Maximum Security Pressed Steel Frame
PSS	Patient Service Strip
PT	Paint
PTA	Partition Top Anchor
PTD	Paper Towel Dispenser
PTDD	Paper Towel Dispenser & Disposal
PT-E	Paint – Epoxy
PVB	Polyvinyl Butyral
PVC	Polyvinyl Chloride
PVDF	Polyvinylidene Fluoride
PWF	Preserved Wood Foundation
QTZ	Quartz
QUV	Q-Panel Laboratory Ultraviolet Testing
R	Riser
RB	Resilient Base
RBL	Roller Blinds
RD	Roof Drain
REC	Recessed
REFURB	Refurbish
REINF	Reinforced
REQ'D	Required
rev	Revision
RF	Radio Frequency
RFFRK	Reinforced Foil Flame Resistant Kraft Facing
RGL	Heat Reflecting Glass
RH	Right Hand
RHR	Right Hand Reverse
RM	Room
RP	Resin Panel
RRPC	Resin Reinforced Polychloroprene
RS	Reducing Strip
RSGL	Leaded Glass/X-ray Shielding Glass
RSF	Resilient Strip Flooring
RSI	R-Value SI
RT	Rubber Tile
RTR	Rubber Tread
RUB	Rubber Flooring
RW	Roller Wave Distortion
RWL	Rain Water Leader
RWP	Rigid Wall Protection
SAN	Sanitary
SAT	Self Adhesive Air/Vapour Barrier Membrane
SB	Sand Blast
SBR	Styrene Butadiene Rubber
SBS	Styrene-Butadiene-Styrene

Abbreviation	Definition
SC	Solid Core
SCG	Side Coiling Grille
SCRN	Screen
SCTR	Shower Curtain Track
SD	Soap Dispenser
SEBS	Styrene-Ethylene-Butylene-Styrene
SFRM	Sprayed Fireproofing/Spray-Applied Fire-Resistive Materials
SGL	Security Glazing
SGL-AR	Attack Resistant Security Glazing
SGL-BR	Bullet Resistant Security Glazing
SGL-FE	Forced Entry Resistant Security Glazing
SGL-FR	Fire Resistant Security Glazing
SH	Sheet Membrane
SHF	Shelf
SHF-HD	High Density Mobile Shelving
SHGC	Solar Heat Gain Coefficient
SH-ST	Shower Seat
SHV	Sheet Vinyl
SHV-C	Sheet Vinyl – Conductive
SHV-S	Sheet Vinyl – Safety
SHV-SD	Sheet Vinyl – Static Dissipative
SHV-WG	Sheet Vinyl – Wood Grain
SIM	Similar
SKFL	Skate Flooring
SLR	Sealer (Concrete)
SLT	Slate Tile
SMAC	Security Metal Acoustic Ceiling
SMP	Silicone Modified Polyester
SN	Stair Nosing
SND	Sanitary Napkin Disposal
'SO' Panel	Swingout Sidelite
SP/DT	Single Pole – Double Throw Switch
SPC	Special Coating
SPD	Soap Dish
SPEC	Specification
SPF	Athletic/Sports Flooring
S-P-F	Spruce-Pine-Fir
SPGL	Spandrel Glass
SPR	Sprinkler
SPS	Solid Polymer Surface
SQ	Square
SR	Seamless Resin Flooring
SRI	Solar Reflectance Index
SS	Stainless Steel
SSCG	Stainless Steel Corner Guard
SSE	Preformed Silicone-Sealant Extrusion
SSG	Structural Sealant Glazed
SSPC	Security Steel Plate Ceiling
ST	Street
STC	Sound Transmission Class
STL	Steel
STN	Stain Finish
STONE	Stone

Abbreviation	Definition
STRUCT	Structural
SUSP	Suspended
SV	Stone Veneer
SW	Slatwall Panelling
SWD	Short Way Of Diamond
SWGL	Switchable Glass/Electrified Privacy Glass
'SX' Panel	Operating Panel (Slide/Swing)
T&G	Tongue & Groove
TB	Tack Board
TBR	To Be Removed
TDD	Towel Dispenser/Disposal
TDL	Towel Disposal
TDT	Traffic Deck Topping
TEL	Telephone
TEMP	Temporary
TERR-C	Terrazzo - Concrete
TERR-E	Terrazzo - Epoxy
TERR-P	Terrazzo - Precast
TGL	Tempered Glass
TH	Towel Hook
TIG	Tungsten Inert Gas Welding
TLV	Threshold Limit Value
TPO	Thermoplastic Polyolefin
TRIM	Finish Trim
TRR	Temperature Rise Rated
TTD	Toilet Tissue Dispenser
TTD-S	Toilet Tissue Dispenser - Safety
TV	Television
TWB	Towel Bar
TYP	Typical
U/C	Undercut
U/G	Underground
U/S	Underside
UC-BGL	Ultra Clear Back-Painted Glass
UCGL	Ultra Clear Glass (Low-Iron)
UNO	Unless Noted Otherwise
UV	Ultraviolet
VAC	Alternating Current - Voltage
VB	Vapour Barrier
VBX	View Box
VCT	Vinyl Composite Tile
VDC	Direct Current - Voltage
VERT	Vertical
VEST	Vestibule
VFD	Variable Frequency Drive
VG	Vision Glazing
VLТ	Visible Light Transmittance
VOC	Volatile Organic Compound
WB	White Board/ Marker Board

Abbreviation	Definition
WC	Wall Covering
WC	Water Closet
W-CAB	Writing Cabinet
WCP	Wood Ceiling Panel
WD	Wood
WDV	Wood Face Veneer
WF	Wide Flange
WG	Wood Grain
WGL	Wired Glass
WHC	Wheel Chair
WHMIS	Workplace Hazardous Materials Information System
WI	Wrought Iron
WM	Wire Mesh
WP	Wall Protection
WPM	Waterproofing Membrane
WR	Washroom
WSC	Wood Slat Ceiling.
WVP	Wood Veneer Panel
WWF	Welded Wide Flange
WWM	Welded Wire Mesh
Z	Zinc
ZCS	Zinc Coated Steel
ZVB	Zone Valve Box

1.4 UNITS

Abbreviation/Symbol	Definition
#	Number (before numerals)
∠	Angle
∅	Diameter
℄	Centreline
±	Plus/Minus
A	Ampere
BTU	British Thermal Units
cu ft	Cubic feet
dB	Decibel
deg C	Degree celsius
deg F	Degree fahrenheit
dia.	diameter
fpm	Feet per minute
ft. (')	Foot
g	Gram
ga	Gauge
gal	Gallon (imperial measure)
ha	Hectare
hp	Horsepower
hr	Hour
HU	Heating unit
Hz	Hertz
in. (")	Inch
kg	Kilogram
kg/m ³	Kilograms per cubic metre
km	Kilometre
kN	Kilonewton
kPa	Kilopascal
l	Litre
l/s	Litre per second
lb	Pound
lb/ft	Pound per foot
lin ft	Linear foot
m	Metre

Abbreviation/Symbol	Definition
m ²	Square metre
m ³	Cubic metre
mm	Millimetre
MPa	Megapascal
N	Newton
o	Degree (angles)
pcf (lb/ft ³)	Pounds per cubic foot
psf (lb/ft ²)	Pounds per square foot
psi	Pounds per square inch
rpm	Revolutions per minute
sq ft	Square feet
sq mi	Square mile
sq yd	Square yard
t	Tonne
V	Volt
W	Watt
yd	Yard

1.5 CODES, STANDARDS AND REGULATIONS

Acronym	Definition
ADA	Americans with Disabilities Act
AODA	Ontarians with Disabilities Act
AWS	Architectural Woodwork Standards
CEC	Canadian Electrical Code (published by CSA)
CFR	Code of Federal Regulations
IBC	International Building Code
LEED	Leadership In Environment And Energy Design
NBC	National Building Code
NBCC	National Building Code Of Canada
OBC	Ontario Building Code
OFC	Ontario Fire Code
OHSA	Occupational Health and Safety Act
SBC	Southern Building Code
UBC	Universal Building Code
WMFL	F.Walker, Mcgough, Foltz And Lyeria Test Procedure

1.7 INDUSTRY AND TRADE ORGANIZATIONS

<u>Acronym</u>	<u>Definition</u>
AA	Aluminum Association (USA)
AAADM	American Association of Automatic Door Manufacturers
AAMA	American Architectural Manufacturers Association
AATCC	American Association of Textile Chemists and Colorists
ACI	American Concrete Institute
AHA	American Hospital Association
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Movement and Control Association International
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
ASCE	American Society of Civil Engineers
ASHE	American Society for Healthcare Engineering
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWCI	Association of the Wall and Ceiling Industry
AWI	Architectural Woodwork Institute
AWMAC	Architectural Woodwork Manufacturers Association of Canada
AWWA	American Water Works Association
BCA	Building Commissioning Association
BCCO	Building Code Compliance Office
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association
BIFMA	Business and Institutional Furniture Manufacturer's Association
BMEC	Building Materials Evaluation Commission
BMHA	Builders Hardware Manufacturer's Association
BOCA	Building Officials and Code Administrators International, Inc.
CaGBC	Canadian Green Building Council
CAN	National Standards of Canada
CCA	Canadian Construction Association
CCDC	Canadian Construction Document Committee
CCMC	Canadian Construction Material Centre
CCMPA	Canadian Concrete Masonry Producers Association
CFCA	Concrete Floor Contractors Association of Canada

<u>Acronym</u>	<u>Definition</u>
CFIA	Canadian Food Inspection Agency
CGA	Canadian Gas Association
CGSB	Canadian General Standards Board
CISC	Standard Practice for Steel, Structural, for Buildings
CISCA	Ceilings and Interior Systems Construction Association
CLA	Canadian Lumbermen's Association
CMHC	Canadian Mortgage and Housing Corporation
CMPA	Concrete Masonry Products Association
COFI	Council of Forest Industries of British Columbia
CPA	Composite Panel Association
CPCI	Canadian Precast/Prestressed Concrete Institute.
CPMA	Canadian Paint Manufacturers Association
CRCA	Canadian Roofing Contractors Association
CRI	Carpet and Rug Institute
CSA	Canadian Standards Association
CSC	Construction Specifications Canada
CSDMA	Canadian Steel Door Manufacturers Association
CSPI	Corrugated Steel Pipe Institute
CSSBI	Canadian Sheet Steel Building Institute
CTC	Canadian Transport Commission
cUL	Underwriter's Laboratories Incorporated (USA)
CWC	Canadian Wood Council
DND	Department of National Defence, Construction Material Board
ECP	Environmental Choice Program
EEMAC	Electrical and Electronic Manufacturers Association of Canada
EPA	Environmental Protection Agency
ESA	Electrical Safety Authority
FM	Factory Mutual
GANA	Glass Association of North America
HMMA	Hollow Metal Manufacturers Association
HPVA	Hardwood Plywood and Veneer Association
IAPMO	International Association for Plumbing and Mechanical Officials
ICC	International Code Council
ICC-ES	International Code Council - Evaluation Service
ICPA	International Cast Polymer Alliance
ICRI	International Concrete Repair Institute
IEEE	Institute of Electrical and Electronic Engineers
IESNA	Illuminating Engineering Society of North America
IGMA	Insulating Glass Manufacturer's Alliance
IGMAC	Insulating Glass Manufacturers Association of Canada
ISO	International Organization for Standardization

<u>Acronym</u>	<u>Definition</u>
ISSFA	International Solid Surface Fabricators Association
ITS	Intertek Testing Services
LSGASM	Laminators Safety Glass Association
MPI	Master Painters Institute
MTO	Ministry of Transportation, Province of Ontario
NAAMM	National Association of Architectural Metal Manufacturers
NBFU	National Board of Fire Underwriters (USA)
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NHLA	National Hardwood Lumber Association
NIOSH	National Institute of Occupational Safety and Health
NLGA	National Lumber Grades Authority
NPA	National Particleboard Association
NRCA	National Roofing Contractors Association
NRCC	National Research Council of Canada
NSC	National Standards Council
NSF	National Science Foundation - Food Safety and Quality
OAA	Ontario Association of Architects
OFM	Ontario Fire Marshall
OGCA	Ontario General Contractors Association
OIRCA	Ontario Industrial Roofing Contractor's Association
OLS	Ontario Land Surveyors
OMCA	Ontario Masonry Contractors' Association
OPCA	Ontario Painting Contractors Association
OPSS	Ontario Provincial Standards For Roads And Public Works
OSHA	Occupational Safety and Health Administration
PCI	Precast/Prestressed Concrete Institute
PEO	Professional Engineers of Ontario
PIMA	Polyisocyanurate Insulation Manufacturers Association
RSIC	Reinforcing Steel Institute of Canada
SCAQMD	South Coast Air Quality Management District
SEI	Structural Engineering Institute
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SSPC	Steel Structures Painting Council
SWRI	Sealant, Waterproofing and Restoration Institute
TSSA	Technical Standards & Safety Authority
TTMAC	Terrazzo Tile and Marble Association of Canada

<u>Acronym</u>	<u>Definition</u>
UL	Underwriters Laboratories Inc.
ULC	Underwriters Laboratories of Canada
ULI	Underwriters Laboratories (International)
USGBC	U.S. Green Building Council
WDMA	Wood Door Manufacturers Association
WH/WHI/ WHPS	Warnock Hershey
WI	Woodwork Institute

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

- .1 Be informed of procedures to be followed on the Contract and the degree of testing and inspection to be expected during course of the Work. Coordinate testing and inspection work and furnish labour and materials as necessary to accommodate the work described under this Section.

1.2 APPOINTMENT OF TESTING AND INSPECTION COMPANIES

- .1 From time to time during progress of the Work, the Owner may require that testing be performed to determine that materials provided for the Work meet specified requirements, installation of specified materials is in compliance with approved methods, and final resulting assemblies meet specified performance requirements.
- .2 The Owner will, with recommendations from the Consultant, appoint testing and inspection companies, representing, reporting and responsible to the Owner through the Consultant, except the following, which must be included in the Contract Price:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities and Authorities Having Jurisdiction.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified in the Contract Documents to be carried out by Contractor under supervision of Consultant.
 - .6 Inspections and tests specifically indicated to be Contractor's responsibility in Divisions 02 – 49 of the Project Manual.
- .3 Where tests or inspections by designated testing laboratory reveal Work not in accordance with the Contract requirements, pay costs for additional tests or inspections as required by Consultant to verify acceptability of corrected work.

1.3 PAYMENT FOR TESTING AND INSPECTION SERVICES

- .1 The cost of testing and inspection will be authorized as a cash allowance item under the price and payment procedures set out in Section 01 20 00 – Price and Payment Procedures.
 - .1 Testing and inspection companies shall submit monthly invoice original to the Consultant and a copy to the Owner for review, relating invoices to tests and inspection reports. Provide original receipts for all disbursements.
 - .2 When approved for payment, invoices will be forwarded by the Consultant to the Contractor for inclusion in the Contractor's next progress payment application.

1.4 INSPECTION AND TESTING REQUIRED BY CONTRACT DOCUMENTS:

- .1 Appoint and pay independent inspection and testing company to verify the requirements of the Contract Documents. Be responsible for quality control. Employ quality control staff, supervisors and implement quality control procedures.
- .2 Inspection and testing required by Contract Documents, codes, regulations, plan approval authority, other legally constituted authorities and/or Authorities Having Jurisdiction shall be the Contractor's responsibility and paid for by the Contractor.
- .3 Additional testing required as a result of changes in materials, proportions of mixes requested by Contractor and Subcontractors as well as any extra testing of materials occasioned by lack of identification or by their failure to meet Specification requirements or testing of structure or elements including load testing, shall be carried out at the Contractor's expense.
- .4 A review by the Consultant and/or other consultants does not relieve the Contractor of its responsibility for performance of the Work in accordance with the Contract Documents. The Contractor shall be responsible for the care and control of the Work and is solely responsible for quality control and shall implement supervisory and quality control procedures. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

1.5 INSPECTION AND TESTING REQUIRED BY CONSULTANT:

- .1 In addition to the inspection and testing specified to be provided as part of the Work or provided by the Contractor for its own verification of the Work, the Consultant may appoint separate inspection and testing companies for certain work where specifically stated in the Contract Documents or where the Consultant may later require. Wherever documents state that inspection and testing companies may be appointed by the Owner or Consultant, give adequate notice prior to commencement of this portion of the Work to the Consultant to determine if such inspection and testing companies will be appointed.
- .2 Services performed by inspection and testing companies and other consultants serve to assist the Consultant and do not to replace the Contractor's responsibility for conforming to the requirements of the Contract Documents. The Contractor is responsible for continuous checking and inspections of the Work to ensure the Work is in accordance with the Contract Documents it proceeds. In such cases, the following will apply:
 - .1 The Owner will pay costs of such additional inspection and testing; except where such additional tests or inspections reveal Work not in accordance with Contract, the Contractor shall bear cost of such tests and further tests as required to verify the acceptability of corrected Work;
 - .2 The Consultant will advise the Contractor of work to be inspected and companies appointed and will provide the testing companies with necessary Drawings and Specifications;
 - .3 The Contractor will advise and coordinate with the Consultant and applicable inspection and testing companies a minimum of five (5) Working Days prior to commencement of the work to be inspected or tested and ensure proper facilities and coordination are provided. Do not perform any work without the required inspection and testing.
- .3 Establish a schedule of testing, number of testing reports and submission and distribution of testing reports. Provide to the Consultant all pertinent data regarding Site conditions, dates, test references, product identification, procedures and description, instructions and recommendations and other relevant information. Identify clearly the Product and system not meeting the requirements of the Contract Documents and submit measures and recommendations for

correcting the situation. Advise the Consultant promptly when a Product or system fails to meet the applicable standards.

- .4 Materials and work not in accordance with the requirements of the Contract Documents will be rejected at any time during the progress of the Work. Defective material and work, whenever found prior to Total Performance of the Work, may be rejected regardless of previous inspection or testing.
- .5 Any inspection shall not constitute a relief of the Contractor's responsibility under the Contract, but shall serve as a precaution against oversight or errors.
- .6 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Owner, through the Consultant, reserves the right to have tests, inspections or surveys performed and analytical calculations of structural strength (and the like) made in order to help determine the extent of the defect and whether work must be replaced. Tests, inspections or surveys carried out under these circumstances will be made at the Contractor's expense, regardless of the test results.

1.6 TESTING AGENCY QUALIFICATIONS

- .1 Conduct testing in accordance with the requirements of the OBC unless advised otherwise in the Contract Documents or by the Consultant. Obtain certification where required by the applicable codes and standards. The Contractor shall also:
 - .1 Ensure the testing agency is an independent testing agency with experience and capability to conduct the relevant testing, as documented according to ASTM E548-94e1 Standard Guide for General Criteria Used for Evaluating Laboratory Competence
 - .2 Quality assurance protocols and capability of testing agencies to perform designated tests on construction materials shall be evaluated in accordance with the following:
 - .1 ASTM E329-11: Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
 - .2 ASTM E699-09: Standard Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components
- .2 Qualifications of Inspectors: Submit a list of inspectors to be employed on the Work and obtain the Consultant's approval.
- .3 Perform all testing and inspection using qualified inspectors and/or technologists certified by a professional engineer or performed directly by a professional engineer registered to practice in the Province of Ontario in conformance with applicable codes and certification programs.

1.7 QUALITY ASSURANCE

- .1 Qualifications of Inspectors: Inspectors for this Work shall be as recommended by the Consultant, subject to approval of the Owner.
- .2 All work of the testing and inspection agency shall be performed by qualified and/or certified personnel under professional supervision or performed directly by a professional engineer registered to practice in the Province of Ontario in conformance with all applicable codes and certification programs.
- .3 All testing shall be conducted in accordance with the requirements of the OBC, except where this would, in the Consultant's opinion, cause undue delay or give results that are not representative

of the rejected material in place. In such a case, tests shall be conducted in accordance with the standards given by the Consultant.

- .4 Obtain certification where required by applicable codes and standards.
- .5 Refer to GC 2.3 – Review and Inspection of the Work of the General Conditions of the Contract for further details regarding rejected work.

1.8 COOPERATION WITH TESTING AND INSPECTION COMPANIES

- .1 Representatives of the testing laboratories shall have access to the Work at all times; provide facilities for such access in order that the laboratories may properly perform its function.
- .2 Cooperate with testing and inspection companies and give adequate notice to the Consultant of any changes in source of supply, additional work shifts and any other proposed changes.
- .3 Prior to commencing significant segments of the Work, give appropriate notification to the Consultant and independent testing and inspection agencies so as to afford them reasonable opportunity to review work previously completed. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.
- .4 Install no Product before it is tested when a test is specified in the Contract Documents. Do not execute any work where a test or inspection is required and the inspectors cannot attend.
- .5 Cooperate in permitting access for inspection to all places where the Work is being done or material is stored prior to shipping.
- .6 Allow free access to testing agencies and supply necessary sampling materials for tests. Supply additional labour required to assist the testing and inspection companies in making tests.
- .7 The testing and inspection service does not relieve the Contractor of its responsibility for normal shop inspection, quality control of production and for errors made by them. The testing and inspection also does not constitute the Owner's acceptance of any of the Work.

1.9 REPORTS AND DOCUMENTS

- .1 The Contractor shall ensure that the testing and inspection company will submit shop inspection and Site inspection reports within 5 Working Days of each inspection.
- .2 Distribute reports as follows:
 - .1 Owner, 1 copy;
 - .2 Consultant, 2 copies;
 - .3 Contractor, 2 copies (1 for Data Manual); and
 - .4 Engineering Consultants, 1 copy each;
- .3 The Contractor shall ensure that the inspectors will provide a written report on each inspection or test, including in the report: all pertinent data as to Site conditions, dates, test references, actual product identification, procedures and descriptions, Site instructions given, recommendations and any other information required by standards applicable to the reporting of tests and inspections;
 - .1 The reports shall clearly indicate any failure of Products or procedures to meet the applicable standards. Give recommendations for retesting or correction. The Contractor shall contact the Consultant immediately when product or procedure fails to meet applicable standards.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TESTING AND INSPECTION OF MECHANICAL SYSTEMS

- .1 In addition to testing procedures and Contractor's periodic field review during construction performed under Divisions 20, 21, 22 and 23, carry out certifications required by the Authority Having Jurisdiction.
 - .1 See the Mechanical Divisions noted above for further testing requirements.

3.2 TESTING AND INSPECTION OF ELECTRICAL SYSTEMS

- .1 Refer to Division 26 - Electrical for further testing requirements.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Provide and maintain, for the duration of the Work, adequate temporary supports, structures, light, power and water in accordance with the Conditions of the Contract as amended by any Supplementary Conditions and as required by trades and to permit the Work to proceed without delay. Conform to requirements of the applicable health and safety regulations.
- .2 Where required by authorities having jurisdiction, apply and pay for permits necessary to permit provision temporary facilities and controls.
- .3 Remove temporary facilities and controls when directed by Consultant or Owner, or when they no longer server their purpose. Remove temporary facilities and controls at no additional cost to Owner.
- .4 Unless specified otherwise in Contract Documents, costs associated with the provision and removal of temporary facilities and controls, including but not limited to, temporary light, temporary power and temporary water (as applicable) shall be included in Contract Price.
- .5 Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- .6 Control noise and vibration generated by the Work. Respond immediately to complaints of noise and vibration received from public, authorities, or Consultant.

1.2 TEMPORARY FIRE PROTECTION

- .1 Provide adequate fire protection to satisfaction of authorities having jurisdiction, the local fire department, the Consultant, the Owner, and its insurance agents. Maintain such fire protection and systems in operation at all times (24 hours per day).
- .2 Provide and maintain temporary access routes to exits, to control valves and hoses on fire lines within building and to all portable fire extinguishers at all times. Ensure devices are visibly identified.
- .3 Provide and maintain free access from street to fire hydrants and to outside connections for standpipes and other fire extinguishing equipment, whether permanent or temporary, at all times.
- .4 Provide and maintain in working order, suitable ULC-labeled fire extinguishers and locate them in prominent positions, to satisfaction of authorities having jurisdiction.
- .5 Where tarpaulins are used, only fire-resistant types are permitted.
- .6 Where required, Provide and maintain sufficient temporary standpipes and connections, fire hoses, valves, temporary cabinets, fire extinguishers, and similar fire suppression equipment, as the Work proceeds in accordance with requirements of authorities having jurisdiction.
- .7 Where required, adjust and modify temporary fire protection facilities to accommodate progress of the Work.
- .8 Storage and handling of flammable materials:
 - .1 Bulk storage of flammable liquids and other hazardous materials on site is not permitted.
 - .2 Transport and dispose of gasoline, benzine or other flammable materials in accordance with best practice for safe handling required by authorities having jurisdiction.

- .3 Take necessary precautions to eliminate fire hazards and to prevent damage to the Work, building materials, equipment and other property adjacent to the Work. Provide weekly inspections to ensure precautions are in effect.
- .4 Store and locate materials and equipment packed in cardboard cartons, wood crates and other combustible containers in orderly and accessible manner. Place approved types of firefighting equipment in vicinity of materials or equipment packed in this type of crate or carton until permanent fire protection and equipment are available.
- .5 Store rags and waste containing oil, grease or other flammable materials in an approved metal container and remove from site at end of each Working Day.
- .9 Minimum Fire Risk Mitigation Precautions:
 - .1 Prior to commencing construction activities in any area, ensure workers are acquainted with locations of fire-fighting apparatus and are familiar with its proper use and operation. Ensure apparatus is in good working order.
 - .2 Stop work immediately if deficiencies in fire protection are encountered, even after work has commenced. Remedy deficiencies before resuming work.
 - .3 In areas where spraying water will not cause damage to construction, including roof level areas, thoroughly wet areas before commencing welding, oxyacetylene-cutting, brazing, grinding or other hot work operations. Keep areas thoroughly wet until for least 30 minutes after the last hot work activity ceases.
 - .4 In areas where spraying water will cause damage to construction, provide approved fire-retardant mats or blankets to cover areas which might be reached by sparks, flame, hot slag, or other hot material produced from welding, cutting, brazing, grinding, or other hot work operations. Also provide rubber-lined blank flanges, plugs, caps, or other suitable means to seal openings and protect them from hot materials. Fill such plugged areas with water before commencing hot work operations. Stop work immediately if water is lost or drained from plugged areas.
 - .5 When performing operations such as electric or gas welding, brazing, and cutting, that will produce an open flame within 3 m (10 feet) of a space that may be occupied, keep a portable fire extinguisher at locations available to operator at all times, but not more than 3 m (10 feet) away from operator.
- .10 Fire Watch: Provide adequate fire watch at all times during activities indicated in this Section. Maintain fire watch while activities are in progress and until sources of ignition or flames have been extinguished and for a minimum duration of 60 minutes after activities have ceased, or until fire hazards no longer exist. Monitor areas for longer period where required by requirements of authorities having jurisdiction.
 - .1 Provide a fire watch for each of following activities in operation on a single floor or in a single area, regardless of number of occurrences, duration or scope of activity:
 - .1 open flame activities (e.g. soldering, welding and similar operations).
 - .2 shutdown of fire detection system.
 - .3 shutdown of sprinkler system.
 - .4 any other situation that Consultant may deem appropriate.
- .11 Ensure fire watchers have suitable fire extinguishers on hand at all times. Ensure fire watchers are not assigned to duties other than fire watch. Fire watch must continue through coffee breaks, meals and after normal work hours as required.

- .12 Should a fire of any nature occur, immediately notify fire department and Consultant, whether the fire has been extinguished or not.

1.3 TEMPORARY HEATING, COOLING, AND VENTILATING

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- .2 Provide adequate temporary heating, ventilation and cooling to enclosed portions of building until Substantial Performance of the Work to protect work underway and completed work. Provide temporary heating, ventilation and cooling in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .3 Also provide temporary heating, ventilation and cooling for portions of the Work exposed to atmospheric elements during construction. Provide sufficient protection at exposed areas to prevent against damage to existing adjacent materials and finishes.
- .4 Temporary heating, ventilation and air conditioning includes, but is not limited to, heating, cooling and desiccant-based de-humidification equipment, associated power cables, gas lines, temporary ductwork and accessories.
- .5 Construction heaters and other temporary equipment used inside building must be vented to outside or be flameless type. Do not use direct-fired space heaters and propane, salamander-type heaters. Ventilate heated areas adequately and keep building free of exhaust and combustion gases.
- .6 Supervise operation of temporary heating and ventilation equipment. Maintain temporary climate control equipment in service until Substantial Performance of the Work, successful commissioning of new HVAC equipment, or until use is no longer required.
- .7 Remove climate control equipment from site at successful commissioning of new HVAC equipment.
- .8 Control condensation and maintain appropriate environmental conditions, including air and surface temperatures suitable for surface preparation, application and curing of paints and coatings.
- .9 Conform to noise criteria requirements for equipment specified in Contract Documents. Refer to Section 01 45 16 for additional requirements.
- .10 Submittals: Prior to installing temporary heating, cooling, and ventilating equipment, submit the following to Consultant for review.
 - .1 Submit schematic equipment layout, duct and/or pipe route, staging, sequencing layouts, enclosure and barricade construction.
 - .2 Submit Product data, climate control equipment, temperature and humidity controls, duct, duct accessories, pipe and piping accessories materials and construction.
- .11 Temporary Ventilating:

- .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
- .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
- .3 Dispose of exhaust materials in manner that will not result in harmful exposure to people.
- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.
- .6 Continue operation of ventilation and exhaust system for time after cessation of work process to ensure removal of harmful contaminants.

1.4 USE OF BUILDING'S PERMANENT HVAC SYSTEM

- .1 Do not use building's permanent HVAC System or similar permanent facilities and controls without obtaining prior written permission from Consultant and Owner.
- .2 Before any portion of building's permanent HVAC system can be considered for use by Contractor, comply with following requirements:
 - .1 Equipment must be properly commissioned with safety and operating Contract devices operational.
 - .2 Comply with proper electrical power requirements, and ensure equipment is operating within nameplate ratings.
 - .3 Ensure rotation of equipment certified.
 - .4 Ensure flow rates of equipment have been confirmed to be within design tolerances.
 - .5 Operating and Maintenance Manuals for equipment must be submitted by Contractor and accepted by Owner.
- .3 Where building HVAC system is available, and its use is permitted by Consultant and Owner for temporary purposes, Contractor shall be responsible for maintenance, servicing, and repairing of damage to systems. Equipment must be serviced and maintained in accordance with requirements of Operating and Maintenance Manuals while in use by Contractor.
- .4 On completion of Work for which permanent HVAC system was used, perform the following: replace filters, inspect and replace defective bearings, lubricate bearings and clean strainer baskets. Provide additional Make Good activities including, but not limited to, painting of equipment if required, repacking of pumps, cleaning out of ductwork and other activities as determined by Consultant.
- .5 Date of Substantial Performance of the Work and warranties for HVAC system shall not commence until entire system is in as near original condition as possible and is signed off as such by Consultant. Warranties shall not commence earlier than date of Substantial Performance of the Work, except as otherwise specified.
- .6 For phased work, warranties may commence at "In-Service Date" of phased portion to the Work when such phase is deemed to meet OBC requirements as reviewed by Consultant and occupancy certificates have been issued by authorities having jurisdiction.

1.5 TEMPORARY LIGHTING

- .1 Maintain level of illumination on all floors and stairs of not less than 161 lux (15-foot candles). When finishing trades are performing Work, Provide illumination comparable to final illumination.

1.6 TEMPORARY TELECOMMUNICATIONS

- .1 Provide and pay for temporary telephone, cable and wireless internet hook up, lines and equipment necessary for own use.

1.7 TEMPORARY WATER SUPPLY

- .1 Provide connections, piping and fittings for distribution of water and remove such temporary distribution upon completion of the Work.

1.8 TEMPORARY SUPPORT STRUCTURES AND FACILITIES

- .1 Employ professional structural engineers licensed to practice in Province of Ontario with experience in design of temporary work to design temporary construction requiring structural performance as required by law or by Contract Documents, and in cases where temporary facilities and their methods of construction are such that professional engineering skill is required to produce safe and satisfactory results.
 - .1 Should redesign of structure be required to accept temporary construction, loadings or other modifications, pay costs associated with Consultant's redesign of structure to accept such additional loadings. Provide additional underpinning, reinforcing and shoring as required to accommodate new loads, and at no additional cost to Owner.
 - .2 Provide and maintain temporary guards, ladders, ramps, walks and handrails as necessary during construction in compliance with requirements of authorities having jurisdiction and applicable health and safety legislation.

1.9 FIELD OFFICES AND SHEDS

- .1 Provide field offices, storage and fabrication sheds, and other support facilities as necessary for construction operations.
- .2 Contractor's Field Office:
 - .1 Provide Contractor's field office or site trailer to accommodate site meetings within the Place of the Work. Ensure office is properly painted and maintained. Provide office of sufficient size to accommodate site meetings, heated to 22 degrees C, lighted to 750 lx and properly ventilated. Furnish office with a drawing laydown table.

1.10 MEAL AREA

- .1 Provide and regularly maintain designated temporary lunch areas to be used by workers on site in accordance with requirements of authorities having jurisdiction and applicable health and safety legislation.

1.11 SANITARY FACILITIES

- .1 Provide and maintain temporary sanitary facilities for use by workers in compliance with applicable health and safety legislation, and requirements of authorities having jurisdiction. Existing sanitary facilities may only be used with Owner's express approval.

1.12 TEMPORARY PARKING AREAS

- .1 Parking for Contractor's vehicles is Contractor's responsibility. Contractor is responsible for making own arrangements. Owner will not be responsible for parking fines incurred by Contractor, Subcontractors or their employees. Existing parking facilities may only be used with Owner's express approval.

1.13 TRAFFIC CONTROL

- .1 Do not block public roads, or impede traffic during the course of the Work, unless otherwise permitted. If necessary to temporarily block traffic, Provide and pay for trained personnel acceptable to authorities having jurisdiction to direct traffic as required.
- .2 Do not block streets, walkways or allow their use for parking by construction crew or visitors except with approved specific permission from appropriate authorities and in accordance with stipulated standing regulations and restrictions.
- .3 Do not be nuisance to public traffic any time. Manage construction traffic by using designated roads and by providing trained flag persons to direct public traffic as appropriate.
- .4 Minimize traffic movement and temporary closing of access streets.

1.14 POLLUTION CONTROL

- .1 Take appropriate dust control measures to avoid contamination of adjacent areas near site from dust. Respond immediately to complaints of dust received from public, authorities, or Consultant. Keep public and private roads free of dust, mud and construction debris resulting from trucks employed on this Project.

1.15 NOISE AND VIBRATION CONTROL

- .1 Control noise and vibration generated by the Work. Respond immediately to complaints of noise and vibration received from public, authorities, or Consultant.

1.16 TEMPORARY SAFETY SIGNS

- .1 Provide signs as required to inform public and individuals seeking entrance to Project.
- .2 Signs and notices for safety and instruction language of Contract Documents.
- .3 Provide graphic symbols conforming to CAN/CSA-Z321.
- .4 Provide temporary, directional signs for construction personnel and visitors.
- .5 Maintain and touch up signs, so they are legible at all times.
- .6 No other signs or advertisements, other than warning signs, are permitted on site.

END OF SECTION

PART 1 - GENERAL

1.1 BASIC PRODUCT REQUIREMENTS

- .1 Where Specification requirements include design of a Product or system and minimum material requirements are specified, the design of such Product or system shall employ the materials specified within the applicable Section. Where materials or components are not specified, the Contractor shall augment materials with those of its choice within the applicable Code limitations while maintaining integrity of design and architectural requirements.
- .2 Defective Products, whenever identified by the Consultant or Owner prior to completion of the Work will be rejected, regardless of previous reviews by the Consultant or a testing company. The Consultant's and/or Owner's review shall not be considered to be complete in every detail or exhaustive and shall also not relieve any Contractor, Subcontractor, Supplier, manufacturer, fabricator, or other third party of responsibility for any deficiency that may exist or for any departures or deviations from the requirements of the Contract Documents or of the responsibility to co-ordinate the Work, or portion of the Work, of one trade with another. The Contractor shall remove and replace defective and/or damaged Products at its own expense and be responsible for delays and expenses caused by the rejection Products.
- .3 Refer to Section 01 81 13 for additional requirements.

1.2 MATERIAL, EQUIPMENT AND FIXTURES

- .1 Products employed in the Work shall be those which affect indoor air quality as little as possible. Provide adequate ventilation during installation of finishing materials to avoid effects on indoor air quality.
- .2 Unless otherwise indicated in the Contract Documents, maintain uniformity of Product and manufacturer for any like item, material, equipment or assembly.

1.3 TOXIC OR HAZARDOUS SUBSTANCES AND MATERIALS

- .1 Products, materials and substances employed in the Work shall be free of mould amplification. In addition to the requirements specified herein, take special care while handling, storing and installing materials such as, without limitation, particleboard, plywood, cellulose materials, wallpaper, ceiling panels, gypsum boards and insulation with kraft paper back up.
- .2 Product with visible or invisible signs of mould amplification, whether installed or not, shall be considered defective and shall be removed at the Contractor's expense. Where mould amplification is suspected, retain a qualified and experienced bio-contamination investigator acceptable to the Consultant to conduct sampling and laboratory analysis and other required assessment steps to determine whether or not materials are impacted by mould amplification and follow up recommended contamination management method. The Contractor shall pay for sampling and assessment costs if the Contractor causes the mould amplification. As a minimum requirement, conform to the New York City Department of Health and Mental Hygiene November 2008, "Guidelines on Assessment and Remediation of Fungi in Indoor Environments", and appropriate levels of requirements for mould removal.
- .3 Ensure construction workers are not exposed to amplified moulds. Take every reasonable precaution in the circumstances for the protection of workers, as air movement and handling of contaminated material can release spores into the atmosphere which can cause adverse health effects. Mould metabolites, including mycotoxins, when in contact with skin or inhaled may irritate skin, eyes, nose and throat resulting in allergy-like symptoms such as difficulty in

- breathing, runny nose, watery eyes, fatigue, headache, asthmatic attacks and general 'flu' like symptoms.
- .4 Be familiar with Mould Guidelines for the Canadian Construction Industry standard construction document CCA 82, 2004.
 - .5 Where odourless Products are not available, Products shall be chosen, where possible, so odours are minimized within a one month gas-off period following installation at normal occupancy ventilation levels. Ventilation levels during the construction period shall be set sufficiently high to encourage the gassing off of materials to their minimum levels prior to occupancy of the building.
 - .6 Select Products for installation, especially within the air-handling and distribution systems, to minimize the introduction of pollutants into the fresh air supply to the building.
 - .7 With respect to the material, plant, equipment and fixtures specified in the Contract Documents, where more than one brand or manufacturer is named in the Specifications or on the Drawings, the Contractor shall use one of the specified manufacturers or brands (or equivalent) provided that the requirements of Drawings and Specifications are met.
 - .8 Ensure materials, plant, equipment and fixtures are not damaged or defective and of the quality specified in the Contract Documents and compatible for its intended purpose. If requested by the Consultant, provide evidence as to type, source and quality of any material, plant, equipment or fixture. The Contractor shall remove and replace defective Products, at its own expense, regardless of previous reviews, and be responsible for delays and expenses caused thereby. Replace factory finished equipment, or parts thereof, whose paint finish is damaged and cannot be reasonably remedied by paint touch-up.
 - .9 When conflict occurs between specified technical description and manufacturer's standard model numbers and/or manufacturer's printed description of given model number, the technical description specified in the Contract Documents shall govern. Have manufacturers make necessary modifications in its manufacturing methods to meet the requirements specified in the Contract Documents.
 - .10 Do not expose trademarks, labels and nameplates, including applied labels, in finished Work. Remove visible trademarks and labels except those which are giving operating instructions, which are essential to obtain identification of mechanical and electrical equipment for maintenance and replacement purposes, and as required for mandatory fire ratings.
 - .11 The Owner retains the right to select all choices available within specified Products colours, finishes, and other options unless specified otherwise in the Contract Documents.

1.4 AVAILABILITY

- .1 Immediately upon signing the Contract, review Product delivery requirements and anticipate foreseeable supply delays for any items. If delays in the supply of Products are likely or possible, or Products are no longer available, or a specified manufacturer is no longer in business, notify the Consultant of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in the performance of the Work.
- .2 Utilize Products which are specified in the Contract Documents by its proprietary names, by part, or catalogue number. No substitutes for the Products specified by its proprietary names, part or catalogue number shall be permitted without the Consultant's acceptance in writing.
- .3 In the event of failure to notify the Consultant of a specific Product's unavailability at the commencement of the Work and should it subsequently appear that Work may be delayed for such reason, the Consultant reserves the right to substitute more readily available Products of similar character, at no increase in the Contract Price.
- .4 No substitution of materials will be allowed for Products with long delivery times.

1.5 MANUFACTURERS' WRITTEN INSTRUCTIONS

- .1 Unless specified otherwise in the Contract Documents, use each Product in accordance with manufacturers' published written instructions regarding handling, storage, preparation, methods of installation, protection and cleaning. Take into account Site conditions and provide ancillary Products or accessories.
- .2 Conform to the manufacturers' recommended installation temperatures. If finishes are installed at temperatures different from operation or service temperatures, make provisions for expansion and contraction in service in a manner acceptable to the manufacturer and Consultant. Repair the resulting damage should expansion provisions prove inadequate.
- .3 Notify the Consultant, in writing, of conflicts between Contract Documents and manufacturers' instructions so the Consultant may establish the course of action to be taken. If requested by the Consultant, make a copy of those instructions available at the Site.
- .4 Improper installation or erection of Products, due to failure to comply with these requirements, shall require removal and re-installation at no increase in the Contract Price.
- .5 Whenever specific reference to following the manufacturers' directions or instructions is made in the Specifications, upon request from the Consultant, submit to the Consultant copies of such directions or instructions for review before commencing such work.

1.6 PRODUCT DELIVERY, HANDLING AND STORAGE

- .1 Package, crate and brace Products to prevent damage during delivery, storage and handling.
- .2 Provide protection to existing surfaces, finished surfaces and work of others to prevent damage during delivery, storage and handling.
- .3 Store packaged materials in original, undamaged condition with manufacturers' labels and seals intact.
- .4 Handle and store materials in accordance with the manufacturers' and suppliers' recommendations, in protected locations.
- .5 Store materials susceptible to environmental damage in weather-tight enclosures, raised clear of the ground and protected from weather, dampness and deterioration.
- .6 Store and mix paints in a single designated, heated and ventilated room. Remove oily rags and other combustible debris from the Place of the Work daily. Take every precaution necessary to prevent spontaneous combustion.
- .7 Replace Products damaged during delivery to the Place of the Work, storage, handling or installation.
- .8 Conform to written procedures for safe handling, storage and use of noxious and hazardous materials including special precaution, safe clean-up and disposal procedures. Conform to the environmental protection requirements under the OBC.

1.7 FLAMMABLE AND TOXIC MATERIALS

- .1 Enforce and maintain fire prevention methods at the Site in accordance with the requirements of the Authorities Having Jurisdiction. Follow proper safety precautions when employing and storing flammable and toxic materials. Do not permit the accumulation of debris.
- .2 Do not store flammable and toxic materials in the building. Take measures to prevent spontaneous combustion. Place clothes and other disposable materials which are fire hazards in closed metal containers and remove them from the building on a daily basis.

- .3 Provide adequate ventilation where flammable and toxic materials are being applied; use only spark proof equipment during application; prohibit smoking and open flames during application.
- .4 Do not dispose of volatile fluid wastes in storm or sanitary sewers or open drainage courses.
- .5 Do not store materials on the roof which could be subject to falling or blowing off of the roof as result of wind which could cause damage to property and jeopardize public safety.

END OF SECTION

PART 1 - GENERAL

1.1 MOBILIZATION

- .1 After the start-up meeting and before submitting the first billing application, submit a list of major Subcontractors and Suppliers and tentative construction progress schedules; establish submission schedules, long term delivery items and designation of responsible personnel.
- .2 Verify and confirm the location of the Work, temporary office and storage areas with the Consultant.
- .3 Verify the construction facilities, controls, temporary hoarding, dust partitions, parking, hours, noisy work, interruption of services, smoking, cell phone usage and construction aids.
- .4 Verify temporary utilities, safety and first-aid procedure, security procedures, and housekeeping procedures.

1.2 ACCEPTANCE OF CONDITIONS

- .1 Examine the Site, at no cost or risk to the Owner, for all matters relating to the Work, extent of Work, means of access and egress, all obstacles, rights and interests of other parties which may be interfered with during execution of the Work, all conditions and limitations the Contractor ought reasonably to take into consideration in performing the Work, including obstructions, existing structures or facilities, local conditions, actual levels, character and nature of Project, and any other consideration which may affect performance of the Work.
- .2 Examine existing Site conditions at no additional cost to Owner, surfaces and substrata upon which the Work depends. Drawings are, in part, diagrammatic and are intended to convey the scope of the Work and indicate general and approximate location, arrangement and sizes of fixtures, equipment, ducts, piping, conduit and outlets and similar items. Obtain more accurate information about locations, arrangement and sizes from study and coordination of Drawings, including Shop Drawings and manufacturers' literature and become familiar with conditions and spaces affecting these matters before proceeding with the Work.
- .3 Make good surfaces and finishes damaged or disturbed due to the Work to match the existing surfaces and finishes. Ensure that the materials used to repair damage are compatible with the existing work.
- .4 Restore lands outside of limits of Work which are disturbed due to the Work, to its original condition.

1.3 EXISTING SERVICES AND OPERATIONS

- .1 Before commencing the Work, establish the location and extent of existing services in the area of the Work and notify Consultant of any anomalies.
- .2 Make necessary enquiries to determine the locations of existing services such as, but not limited to, hydro, telephone, water, natural gas, and sewer. Temporarily relocate, shore, underpin or in any way accommodate existing services which affect the Work.
- .3 If unknown services are encountered, immediately notify the Consultant and confirm findings in writing. Obtain the Consultant's written direction if such services require cutting, capping or relocation.
- .4 Should any piping, sewers, cables, or similar services be encountered during the Work that are not known from the Owner's and utilities companies' records, Contract Documents or Bid

documents, notify the Consultant and do not proceed with removal or cutting until directed to do so by the Consultant.

- .5 Protect and maintain in operation all existing services and systems. When removing or altering existing services, make safe, secure and maintain seals as applicable for all lines affected.

1.4 GENERAL PREPARATION REQUIREMENTS

- .1 Provide shoring, bracing, and related supports to maintain the integrity of the structural components of the Work.
- .2 Provide protection to adjacent work and obtain Consultant's approval regarding adequacy and type of protection provided.
- .3 Provide protection from ambient temperature and other elements where working outside and at building envelope items.

1.5 CONSTRUCTION LAYOUT

- .1 Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Consultant promptly.
- .2 Engage a land surveyor experienced in laying out the Work, using the following accepted surveying practices:
 - .1 Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - .2 Establish limits on use of Project site.
 - .3 Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - .4 Inform installers of lines and levels to which they must comply.
 - .5 Check the location, level and plumb, of every major element as the Work progresses.
- .3 Notify Consultant when deviations from required lines and levels exceed allowable tolerances.
- .4 Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- .5 Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- .6 Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- .7 Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Consultant.

1.6 PLANNING, SCHEDULING & COORDINATION REQUIREMENTS

- .1 Plan and schedule the Work to accommodate anticipated difficulties, indicated on and inferable from the Contract Documents.

- .2 Co-ordinate the Work with Subcontractors and Other Contractors and proceed with the Work expeditiously.

1.7 INSTALLATION

- .1 Except if otherwise specified in the Contract Documents, use each Product in accordance with the manufacturers' published or written instructions, Specifications or recommendations regarding handling, storage, preparation, Site conditions, ancillary Products or accessories, methods of installation, protection and cleaning. Submit a copy of such instructions to the Consultant and indicate if and where there is discrepancy between the instructions and requirements of the Specifications and obtain direction.
- .2 Whenever specific reference to following the manufacturers' directions or instructions is made in the Specification Sections, submit copies of such directions or instructions to the Consultant as requested thereof for review before commencing such work.
- .3 Execute the Work in accordance with industry practice for the type of Work unless Contract Documents stipulate more precise requirements. Do not let unskilled or incompetent workers perform the Work.
- .4 Execute the Work in a neat and careful manner to retain the Work plumb, square, and straight.
- .5 Ensure the Work is properly related to form close joints and appropriately aligned junctions, edges and surfaces and is free of warp, twist, wind, wave or other irregularities.
- .6 When required by the Specification Sections or manufacturers' recommendations, have the manufacturer, supplier or accredited agent, inspect their Products.
- .7 Load no part of the structure during construction with a load greater than it is calculated to bear safely when completed. Make every temporary support as strong as the specified permanent support. Place no load on a concrete structure until it has sufficient strength to safely carry such load.
- .8 Conceal pipes, ducts, conduits, tubing, wiring and other items requiring concealment in the floor, wall and ceiling construction of finished areas except where indicated or specified otherwise in the Contract Documents. If in doubt as to method of concealment, or intention of Contract Documents, request clarification from the Consultant before proceeding with the work in question.
- .9 Install and arrange fixtures, equipment, ducts, piping and conduit to conserve as much headroom and space as possible, and avoid interference and obstruction of access. Observe good installation practice for safety, access, maintenance and follow the manufacturers' recommendations. The location of fixtures, access panels, outlets and mechanical and electrical components indicated on the Contract Drawings are approximate. Make changes to comply with these requirements at no additional cost to the Owner.
- .10 If requested by the Consultant, and before their installation, relocate equipment, services, doors, openings, furring and other work at no additional cost to the Owner provided such relocation involves only reasonable minor adjustments and reasonable advance notice is given in writing by the Consultant. Ensure the identification of electrical and mechanical system installations and other automated systems or equipment is provided in accordance with the Contract Documents.
- .11 Lay out mechanical and electrical work in advance of concrete placement and furring installation to allow for its proper concealment.
- .12 Test and inspect service piping before applying covering and before work is concealed.

1.8 MECHANICAL & ELECTRICAL LOCATION DRAWINGS

- .1 Mechanical and electrical drawings indicate the approximate locations of mechanical and electrical items diagrammatically. Prior to installation, request and obtain the final locations and arrangement drawings for mechanical and electrical items. Allow the Consultant to adjust final locations within a 1500 mm (5') radius from the diagrammatic position indicated, without change to the Contract Price.
- .2 Align and cluster devices and fitments neatly in accordance with the mounting heights specified in the Contract Documents, properly aligned horizontally and vertically.

1.9 FIRE RATING

- .1 Where material, component or assembly is required to be fire rated, fire rating shall be determined on the basis of results of tests conducted in conformance with CAN/ULC-S101-M by one of following testing authorities acceptable to the Authorities Having Jurisdiction:
 - .1 Underwriters' Laboratories of Canada (ULC); www.ulc.ca
 - .2 Underwriters' Laboratories Inc. (UL); www.ul.com
 - .3 FM Global; www.fmglobal.com <http://www.allendale.com>
 - .4 National Research Council of Canada; www.nrc.ca
 - .5 National Board of Fire Underwriters; www.fireunderwriters.ca
 - .6 Warnock Hersey -ITS; www.etlsmeko.com
- .2 Where reference is made to only one testing authority, an equivalent fire rating as determined or listed by another of aforementioned testing authorities is acceptable if approved by Authorities Having Jurisdiction. Obtain and submit to the Consultant such approval of authorities, in writing, when requesting acceptance of a proposed equivalent rating or test design.

1.10 ANCHORS AND FASTENERS

- .1 Supply the appropriate anchors, fasteners, accessories and adhesives required for fabrication and erection of Work.
- .2 Unless specified otherwise in the Contract Documents, use exposed metal fastenings and accessories of the same texture, colour and finish as the Product being fastened.
- .3 Use metal fastenings of the same material as metal component being fastened, or of metal which will not generate electrolytic action and cause damage to fastening or metal component under moist conditions. In general, use stainless steel or hot dip galvanized steel anchors occurring on or in exterior wall, slab or other exterior locations, unless a higher standard is indicated or specified in the Contract Documents. If anchors or fasteners will be exposed, use stainless steel anchors and fasteners.
- .4 Fastening devices or adhesives shall be of appropriate type, used in sufficient quantity and in such manner as to provide positive, permanent fastening which will not shift, work loose or fail during occupancy of building due to vibration or other causes resulting from normal use of the building. Install anchors at sufficient spacing to provide the required load/stress carrying capacity. Do not use wood plugs.
- .5 Lay out fastenings neatly, evenly spaced and aligned. Keep exposed fastenings to a minimum.
- .6 Supply adequate instructions and templates and, if necessary, supervise installation where fastenings or accessories for any Section are required to be built into work of other Sections.
- .7 Do not use fastenings which will cause spalling, cracking, or deformation or deterioration of material to which, or adjacent to which, they are being fastened.

- .8 Do not use powder actuated fastening devices which are used in tension, without approval by the Consultant. Take stringent safety precautions when using powder actuated fastenings. Use only low velocity plunger-type devices.
- .9 Use the specified adhesives (or, if not specified, those recommended by the manufacturers of the materials involved) compatible with materials to be joined, and effective in forming permanent joint of adequate strength.
- .10 Use screws, nails, staples and other similar, driven fasteners suitable to materials to be joined and to conditions under which they are installed and used. Ensure, in finished work, that fasteners are appropriately sized to take durable hold under stress to be encountered without damage to, or weakening of, elements secured together. Ensure fastenings will not corrode or cause staining of exposed surfaces.
- .11 Braze and solder to form durable connections of strength adequate to resist stresses to be encountered without deformation of the elements joined. Prepare base metals and use methods and materials to ensure clean joints and to prevent staining, corrosion, discolouration, deformation or other damage to finished work.
- .12 Weld in accordance with CSA W59-M for steel and in accordance with CSA W59.2-M for aluminum, unless specified otherwise in the Contract Documents. Have welding performed by companies that are certified operatives in accordance with CSA W47.1 or CSA W47.2-M.
- .13 Provide accessory items or materials required, such as brackets, cleats, connectors, sealants, lubricants, cleaners, protection and similar items, whether specified or not in the Contract Documents, so that the Work is complete and shall perform as required.

1.11 BUILT IN ITEMS

- .1 Provide and coordinate the location of chases, slots and reglets including frames, sleeves, inserts, anchors, fasteners and bolts, forms and templates.

1.12 CONCEALMENT OF SERVICES

- .1 Conceal pipes, service lines and ducts in chases, behind furring or above ceilings, except where they are indicated as being exposed to view on the Contract Drawings. Where no ceiling is provided, such items may be exposed but must be neatly and logically arranged.

1.13 SNOW REMOVAL

- .1 Allow no accumulation of ice and snow on Site and on roof deck when roofing operations are scheduled to take place.
- .2 Be responsible for general clearing of snow from access roads within the Site, Site circulation paths, at hoarding, Contractor's parking areas and elsewhere as required to permit access to the Work, parking and uninterrupted construction progress.
- .3 Maintain trailer area, storage areas as well as the Work areas of this Contract free of ice and snow in order to maintain the progress of the Work. Place cleared snow in areas on Site as directed by the Consultant.
- .4 Remove ice and snow from the Site and from the roof deck when roofing operations are in session.
- .5 Be responsible to keep access road and circulation paths accessible during a snow fall. Remove snow as necessary to prevent the interruption of the Work in progress until completion of the Work.

1.14 TRIAL USAGE AND INSTRUCTIONS

- .1 Thoroughly instruct the Owner's authorized representatives in the safe operation of systems and equipment after installation and prior to Substantial Performance of the Work. Coordinate with the Consultant and arrange schedule for instruction times. Ensure that operating and/or maintenance documents have been submitted to Consultant prior to demonstration. Submit a commissioning schedule to the Consultant a minimum of 4 weeks prior to the commissioning of each system.
- .2 Arrange and pay for the services of qualified service engineers and manufacturers' representatives to instruct the Consultant on specialized portions of installation, such as refrigeration machines, boilers, automatic controls and water treatment.
- .3 Submit a complete record of instructions as part of the maintenance instructions and data book to be given to the Consultant. For each instructional period, supply the following data:
 - .1 date;
 - .2 system or equipment involved;
 - .3 names of persons giving instructions;
 - .4 names of persons being instructed; and
 - .5 other persons present.
- .4 Schedule instructional periods during a 30 Day period not more than 2 Days/week, unless otherwise agreed with the Consultant.
- .5 Permit the Consultant trial usage of the systems or parts of systems for purpose of testing and learning operational procedures. Trial usage shall not affect warranties nor be construed as acceptance of the systems, and no claim for damage shall be made against the Consultant for any injury or breakage to any part or parts of systems due to the aforementioned tests, where such injuries or breakage are caused by a weakness or inadequacy of parts, or by defective materials or quality of performance of any kind.
- .6 Obtain and submit to the Consultant a statement signed by the Owner's representatives stating they understand system and equipment installation, operation and maintenance requirements.
- .7 Obtain and submit to the Consultant letters from the manufacturers of equipment and systems indicating that their technical representatives have inspected and tested systems and have approved methods of installation, connections and operation. Arrange all necessary inspections and approvals.

1.15 PROTECTING INSTALLED CONSTRUCTION

- .1 Protection of Work During Construction
 - .1 Provide continuous protection to public, Work, Owner's property and adjacent property during construction. Protect the work of other trades from damage while performing subsequent work.
 - .2 Protect finished flooring from damage. Make special efforts and take measures when moving heavy loads or equipment over finished flooring. Keep floors free of oils, grime, grease or other materials likely to discolour the flooring or affect the bond of applied surfaces.
 - .3 Adequately protect floors and roofs from damage. Take special measures when moving heavy loads or equipment over them.
 - .4 Make good any damaged Work.

- .5 Protect glass and other finishes against heat, slag and weld splatter using suitable protective shields or covers.
 - .6 Provide and maintain in working order, suitable underwriters' labelled fire extinguishers and locate in suitable positions, to the approval of Authorities Having Jurisdiction.
 - .7 Protect the public and those employed to perform the Work from injury. Equipment (mobile), when not in use, shall have keys removed and locked up in a secure location.
 - .8 Secure the Site, premises, and materials at all times.
- .2 Correction after Completion: In conformance with the General Conditions of the Contract, make good any defects and deficiencies due to faulty materials or quality of performance that become apparent in the Work within 12 months from the date of the Certificate of Substantial Performance or for such longer period for certain Products as specified in the Contract Documents. Conform to the requirements of General Conditions of the Contract and provide a warranty for a 12 month period and for extended periods where applicable, in writing, in an approved form acceptable to the Consultant and signed by an authorized official of the Contractor.

1.16 CLEANING

- .1 Progress Cleaning:
- .1 Keep access areas to the Work in a tidy condition, free from the accumulation of waste products and debris during construction and on completion of the Work, other than any waste or debris caused by the Owner's crew or Other Contractors.
 - .2 Keep the Site and building, including concealed spaces, free from the accumulation of dirt, debris, garbage and excess material. Remove oily rags and waste from the premises at the close of each Working Day, or more often if required by the Consultant.
 - .3 Remove waste material and debris from the Site at the end of each Working Day. Remove from finished surfaces any deposits which could stain, harden, set or become difficult to remove.
 - .4 Remove rubbish and surplus materials promptly and dispose of in a legal manner. Do not allow scrap piles to accumulate. Do not permit fires.
 - .5 Lower waste materials in a controlled manner with minimum handling; do not drop or throw materials from heights. Schedule cleaning operations so dust and other contaminants resulting from the cleaning process will not fall on wet, newly painted surfaces. Sprinkle dusty debris with water.
 - .6 Sweep adjacent roads and sidewalks daily to remove dirt and clods of earth deposited on adjacent public and private properties by construction traffic.
 - .7 Vacuum-clean interior areas prior to the commencement of finishing work and maintain areas free of dust and other contaminants during finishing operations.
- .2 Final Cleaning: Refer to Section 01 77 00.

END OF SECTION

PART 1 - GENERAL

1.1 CLOSEOUT PROCEDURES

- .1 Generally, comply with recommended takeover procedures contained in OAA/OGCA Document No. 100, except as modified by Contract Documents. In case of conflict with Contract Documents conform to more stringent requirements.

1.2 DEFECTS AND DEFICIENCIES

- .1 Neither the Owner nor the Consultant will be responsible for the issuance of deficiencies lists. The Contractor assumes the prime responsibility for ensuring items shown on the Drawings and described in Specifications are complete.
- .2 Promptly correct the deficiencies noted by the Consultant. Do not proceed with the installation of subsequent parts of the Work until deficiencies have been corrected. Make good all defects and deficiencies prior to final inspection of the Work.
- .3 During inspection, a decision will be made as to which elements must be completed at a later date due to uncontrollable circumstances such as weather, which defects must be rectified before the building can be accepted, and which defects are to be treated as warranty items.
- .4 Advise the Consultant in writing upon the completion of rectification of deficiencies. Failure to provide such notification may be cause to withhold final payment.

1.3 FINAL CLEANING

- .1 Prior to occupancy, clean the Place of the Work thoroughly, free of rubbish and surplus material. Dispose of rubbish and debris. Vacate the Place of the Work in a clean and tidy condition satisfactory to the Consultant.
- .2 Prior to cleaning, submit to the Consultant a complete list of manufacturers' cleaning/ maintenance instructions for all components of the Work.
- .3 Final finishing is in addition to and compatible with cleaning and finishing specified in the Specification Sections.
- .4 Clean new and existing components in accordance with the manufacturers' recommendations.
- .5 Remove dust and all marks from:
 - .1 walls;
 - .2 ceilings;
 - .3 window coverings;
 - .4 doors;
 - .5 windows and frames;
 - .6 exposed interior and exterior glazed surfaces;
 - .7 hardware;
 - .8 mechanical and electrical fixtures and equipment; and
 - .9 all metals.

- .6 At the Place of the Work, outside of the building envelope, remove debris, rake sod and sweep sidewalks and pavement.
- .7 Use experienced professional cleaners for final cleaning. Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.
- .8 Final cleaning includes, without limitations, the requirements specified in this Section and the removal of surplus materials, tools, construction machinery and equipment from Site. Carry out final cleaning in accordance with the manufacturers' instructions for each material and in accordance with the applicable Specification Sections.
- .9 Remove stains, spots, marks, dust and smudges caused by work within the Work areas of this Contract from decorative work, electrical and mechanical fixtures, furniture fitments, walls, ceiling and floors. Vacuum, clean and buff resilient flooring.
- .10 Clean and polish interior and exterior glass, windows, entrances, skylights, mirrors, hardware, wall tile, stainless steel, chrome, porcelain, baked enamel, plastic laminate, mechanical, plumbing fixtures and electrical fixtures.
- .11 Vacuum clean and dust building interiors, behind grilles, louvres and screens. Vacuum clean ducts, fans, blowers and coils if units were operated without filters during construction.
- .12 Broom clean and wash interior as well as exterior walks, paved surfaces, concrete floors, steps and other similar surfaces.
- .13 Replace broken, damaged, disfigured or scratched glass and mirrors, which are part of the Work.
- .14 Close rooms and areas finished by cleaners, painters and decorators to all but authorized persons.
- .15 Upon completion of final cleaning, remove cleaning equipment, excess materials and debris from building and Site.

1.4 CLOSEOUT SUBMITTALS

- .1 As-Built Documents:
 - .1 Prior to applying for the Certificate of Substantial Performance, provide an electronic set of as-built Drawings to the Consultant. Submit final reviewed As-Built Drawings and Specifications on electronic disk, and in a set of white prints in the following formats:
 - .1 1 set in AutoCAD v. minimum 2014 format;
 - .2 1 set in PDF format; and,
 - .3 1 set of white prints of Drawings and Specifications.
 - .2 Electronic formats of Drawings and Specifications are to be submitted on USB flash drive.
 - .3 Electronic copies of the Contract Documents may be obtained from the Consultant if necessary. These Drawings may not include changes issued as Addenda, Supplemental Instructions or Change Orders. The Consultant assumes no responsibility for the completeness of the Drawings and inclusion of instructions and details issued during the construction period.
 - .4 Print lettering and numbers in size to match original. Lines may be drawn free hand provided they are neat and accurate. Add "AS-BUILT RECORD" at each drawing title block and on the title page of the Specification Sections.
 - .5 Be responsible for:

- .1 maintaining As-Built Drawings during progress of the Work, in complete sets, at the Place of the Work;
 - .2 including additional changes over and above those included in any addenda, Supplemental Instructions and Change Orders;
 - .3 recording the following changes and deviations on As-Built Drawings:
 - .1 depths of various elements of foundation in relationship to first floor level;
 - .2 field changes of dimensions; and
 - .3 other significant deviations and changes which are concealed in construction and cannot be identified by visual inspection.
 - .4 showing the actual locations of the following on as-built Drawings:
 - .1 access doors and panels;
 - .2 inverts of services at key points within building, at points where entering and leaving building, and at property lines;
 - .3 services dimensions in relation to structure and building grid lines;
 - .4 duct work, piping, conduit, mechanical and electrical equipment and associated the Work; and
 - .5 concealed piping, conduit, equipment and conveying systems, including such items provided for future use.
 - .5 ensuring As-Built Drawings shall include construction, fixed equipment, and mechanical and electrical systems installed or built. Drawings shall include a life safety plan for each floor including, but not limited to, the following:
 - .1 exit signage;
 - .2 fire extinguishers;
 - .3 fire alarm devices;
 - .4 pull stations;
 - .5 sprinkled areas;
 - .6 conformance to NFPA 101 requirements;
 - .7 changes recorded in a manner consistent with original Drawings.
 - .8 removal of outline clouds and notations from Drawings; and
 - .9 incorporation of any review comments made by Consultant;
 - .6 ensuring printed copies of As-Built Drawings and Specification Sections are available for inspection at all times as the Work progresses.
- .2 Operation and Maintenance Data**
- .1 Provide the Consultant with three sets of operating and maintenance instructions and data books, a minimum of 10 Days prior to advising the Consultant that the Work is substantially performed, including:
 - .1 complete listing of materials, Products and equipment including serial numbers, manufacturer's names and sources of supply;
 - .2 description of each system and of each major component of systems;
 - .3 operation and installation instructions for each assembly, component and system;
 - .4 complete cleaning and maintenance instructions for each finish, assembly, component and system, including warnings of harmful practices;
 - .5 lists of spare parts for each assembly, component and system complete with names, addresses and telephone numbers of Suppliers;
 - .6 operating curves of mechanical and electrical equipment;
 - .7 a lubrication schedule of all equipment;
 - .8 page-size valve tag schedule and flow diagrams;

- .9 water treatment procedures and tests;
 - .10 final balancing reports for mechanical systems;
 - .11 installation manual or installation instructions for each mechanical, electrical or architectural item, stamped and signed by the Subcontractors submitting them;
 - .12 As-Built Drawings of mechanical, electrical and special installations;
 - .13 final reviewed Shop Drawings; and
 - .14 copies of all warranties, properly executed.
- .2 Provide books consisting of 3-ring hard cover, loose-leaf binders, indexed as to contents and identified on binding edges as "Operation and Maintenance Data, for <PROJECT NAME>" and include the following:
- .1 title sheet, labelled " Operation and Maintenance Data ", containing Project name and completion date;
 - .2 list of contents;
 - .3 complete listing of installing Subcontractors' names, addresses and telephone numbers with notation as to which portions of the Contract have been provided by them for future repair or maintenance;
 - .4 schedule of finishes (as-built) listing paints, colours and fabrics provided.
 - .5 Refer to Divisions 21, 22, 23 and 26 for supplementary requirements.
 - .6 Provide maintenance instructions as required by the Contract Documents.
 - .7 Ensure binders contain the name of the Contractor and date of Substantial Performance of the Work.
 - .8 Submit all "Operation and Maintenance Data" in PDF format compatible with Adobe Acrobat 5.0 on DVD disc clearly marked and labeled accordingly.
 - .9 Organize and label contents into applicable categories of the Work, parallel to the Specification Sections and include a table of contents.
 - .10 Use consistent terminology in books.
- .3 Submit maintenance and operation data which are the manufacturer's latest published editions at the date of submission. Include the following:
- .1 data books and literature;
 - .2 instructions in plain English to guide the Owner in the proper operation and maintenance of building components;
 - .3 maintenance instructions, specifying warnings of any maintenance practice that may damage or disfigure specified Products;
 - .4 operational information on Products, cleaning and lubrication schedules, filters, overhaul and adjustment schedules and similar maintenance information;
 - .5 recommended maintenance materials; and
- Organize the contents into applicable categories of the Work, numbered to match the Specification Section numbering system. Insert tabs between each Specification Section.
- .4 Should any finish, Product or assembly be injured or damaged by faulty maintenance materials, practices not warned against in maintenance manual or by failure to deliver proper maintenance manuals in time, promptly rectify such damage or injury at no additional cost to the Owner.

1.5 DEMONSTRATIONS FOR OWNER'S PERSONNEL

- .1 Provide qualified technicians to demonstrate operation and/or maintenance of systems to the Owner's staff.

1.6 MISCELLANEOUS CLOSEOUT SUBMITTALS

- .1 Submit:
- .1 hard copies and PDF files of closeout documentation compatible with Adobe Acrobat 5.0 on USB flash drive to the Owner;
 - .2 keys, passwords, licenses, security tools;
 - .3 hydro certificate, Electrical Safety Authority (ESA) certificates and similar certifications;
 - .4 one valve directory, framed behind glass and installed in main mechanical room;
 - .5 electrical panel directories, inside panels;
 - .6 one electrical riser diagram, framed behind glass and mounted; and
 - .7 final certified survey by an Ontario land surveyor.

1.7 WARRANTY PERIODS

- .1 Where equipment includes extended warranty periods (e.g. 5 years) the first year of the warranty period is to be governed by terms and conditions of the standard one year warranty prescribed by the General Conditions of the Contract and the remaining years of the warranty period shall be administered directly by the equipment manufacturer and/or supplier. Submit signed and dated copies of extended warranties to the Consultant.
- .2 Warranties are to include parts, labour, travel costs and living expenses incurred by manufacturer's authorized technician to provide factory authorized on-site service.
- .3 Repair and/or replace any defects that appear in the Work within the warranty period without additional expense to the Owner. Be responsible for costs incurred in Making Good defective work, including repair or replacement of building finishes, other materials, and damage to other equipment. Ordinary wear and tear and damage caused wilfully or due to carelessness of Owner's staff or agents is exempted.
- .4 Do not include Owner deductible amounts in warranties.
- .5 It is understood that warranties are to commence from time of Substantial Performance of the Work, regardless of what is noted within following Sections of Specification. Be responsible for providing whatever "bridging" or additional extended warranty period is required from time that material is purchased until this time.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* selective demolition and salvage including but not limited to following:
 - .1 Demolition and removal of selected portions of building to accommodate alterations.
 - .2 Salvage of existing items to be reused or recycled as noted on *Drawings* and as designated on site.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.
 - .1 Demolition and removal of electrical equipment services designated for removal on *Drawings* and as required by work. Disconnecting and capping prior to authorizing removal: Division 26, Electrical.

1.3 REFERENCES

- .1 Definitions:
 - .1 Remove/Demolish: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
 - .2 Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
 - .3 Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
 - .4 Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- .2 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Division 01.
 - .2 In particular address the following items:
 - .1 Inspect and discuss condition of construction to be selectively demolished.

- .2 Review structural load limitations of existing structure.
- .3 Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
- .4 Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
- .5 Review areas where existing construction is to remain and requires protection.
- .6 Phase demolition as indicated on *Drawings* to accommodate new construction.
- .7 Review restrictions due to infection control requirements and other matters affecting demolition.
- .8 Review requirements for disconnecting and capping by Mechanical and Electrical Divisions.

1.5 SUBMITTALS

- .1 Special Procedure Submittals: Submit Plan of Action in accordance with Division 01 for review by *Consultant*. As a minimum, Plan of Action shall include the following:
 - .1 Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for dust control and for noise control. Indicate proposed locations and construction of barriers.
 - .2 Schedule of Selective Demolition Activities: Indicate the following:
 - .1 Coordinate demolition times, security requirements and access with *Owner*.
 - .2 Coordination of *Owner's* continuing occupancy of portions of existing building and of *Owner's* partial occupancy of completed Work. Ensure *Owner's* on-site operations are uninterrupted.
 - .3 Interruption of utility services. Indicate how long utility services will be interrupted.
 - .4 Coordination for shutoff, capping, and continuation of utility services.
 - .5 Use of elevator and stairs.
 - .3 Inventory: Submit a list of items to be removed and salvaged and deliver to *Owner* prior to start of demolition.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by *Consultant*.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.7 SITE CONDITIONS

- .1 Existing Conditions:
 - .1 *Owner* will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so *Owner's* operations will not be disrupted. Take care and provisions for protection of workers on site and occupants during progress of work.

- .2 Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations. Maintain fire-protection facilities in service during selective demolition operations.
- .2 Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - .1 If suspected hazardous materials are encountered, do not disturb; immediately notify Consultant and Owner.

1.8 WARRANTY

- .1 Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding.
 - .1 Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Comply with CSA S350, ANSI/ASSE A10.6 and NFPA 241.
 - .2 Perform welding and cutting operations during demolition work in accordance with requirements of Fire Code, Regulation under Fire Marshal Act especially Part 5, Hazardous Materials, Processes and Operations, in particular Section 5.17, Welding and Cutting.
 - .3 Provide fire extinguishers acceptable to fire prevention authorities in locations and of type suitable to enable personnel to mitigate fires occurring during progress of Work until arrival of firefighting units.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Before commencing demolition operations, examine site conditions. Assess potential effect of removal of any part or parts on remainder of structure before such part(s) are removed.
- .2 Verify prior to commencement work of this Section that disconnection and capping of mechanical services have been carried out under Division 21, 22 and 23 in accordance with requirements of local authority having jurisdiction.
- .3 Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- .4 When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Consultant.
- .5 Disconnect and re-route electrical and communication service lines entering area to be demolished. Post warning signs on electrical lines and equipment that must remain energized during period of demolition. Arrange for disconnection of services with utility companies.

3.2 PROTECTION

- .1 Erect and maintain partitions as required to prevent spread of dust, fumes and smoke to other parts of building. Maintain fire exits from site. On completion, remove partitions and *Make Good* surfaces to match adjacent surfaces of building.
- .2 If at any time safety of occupants appear to be endangered, cease operations and notify *Consultant*; do not resume operations until permission is granted by *Consultant*.
- .3 If *Consultant* considers additional protection is required and necessary to safeguard and prevent accidents or harm to occupants, *Install* such protection upon *Consultant's* orders. Should *Contractor* fail to comply promptly with such request, such protection may be placed by *Consultant* at *Contractor's* expense.

3.3 DEMOLITION

- .1 Do not rely solely on *Drawings* to limit scope of required selective demolition work. Selective demolition action plans indicate only general scope of demolition and removal work. Review site conditions and assess exact scope of demolition and removal. Be responsible for extent of demolition determined.
- .2 Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - .1 Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - .2 Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - .3 Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - .1 Perform welding and cutting operations during demolition work in accordance with requirements of Fire Code, Regulation under Fire Marshal Act especially Part 5, Hazardous Materials, Processes and Operations, in particular Section 5.17, Welding and Cutting.
 - .2 Maintain adequate ventilation when using cutting torches.
 - .4 Remove decayed or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - .5 Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - .6 Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - .7 Keep work wetted down to minimize dust.
 - .8 Minimize noise. Avoid use of noisy machinery outside working hours.
 - .9 Do not stack materials and debris in building to extent that overloading of any part of structure will occur.
 - .10 Dispose of demolished items and materials promptly and legally.

- .11 At end of each *Day's* work leave work in safe condition ensuring no parts of structure are in danger of collapsing.
- .3 Methods:
 - .1 Demolish and remove interior partitions, walls, ceilings, flooring down to concrete substrate, except those specified and/or indicated to remain and roofing as required.
 - .2 Demolish concrete in small sections. Cut concrete using power-driven saw. Dislodge concrete from reinforcement at areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.
 - .3 Firestopping and Smoke Seal: In event work of this Section impacts on integrity of fire separations, ensure trades performing firestopping is notified, including but not limited to Section 07 84 00 or Divisions 21, 22, 23 or 26 respectively as applicable.
- .4 Removed and Salvaged Items:
 - .1 Clean salvaged items.
 - .2 Pack or crate items after cleaning. Identify contents of containers.
 - .3 Store items in a secure area until delivery to Owner.
 - .4 Transport items to Owner's storage area designated by Owner.
 - .5 Protect items from damage during transport and storage.
- .5 Removed and Reinstalled Items:
 - .1 Clean and repair items to functional condition adequate for intended reuse.
 - .2 Pack or crate items after cleaning and repairing. Identify contents of containers.
 - .3 Protect items from damage during transport and storage.
 - .4 Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- .6 Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Consultant, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.4 DISPOSAL OF WASTE MATERIALS

- .1 As a minimum clear away dirt, rubbish and loose litter resulting from work of this Section on a daily basis.
- .2 Do not sell or burn materials on site.
- .3 Conform to requirements of municipality's Works Department regarding disposal of waste materials. Remove materials prohibited from municipality waste management facilities from site and dispose of, at recycling companies specializing in recyclable materials.
- .4 Remove any additional materials prohibited from waste management facilities from site and dispose of, to requirements of authorities having jurisdiction without any additional cost to *Owner*.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* metal fabrications including but not limited to following:
 - .1 steel framing and supports for overhead openings.
 - .2 steel framing and supports for architectural woodwork elements.
 - .3 steel framing and supports for mechanical and electrical equipment.
 - .4 miscellaneous sections and framing for applications where framing and supports are not specified in other sections.
 - .5 miscellaneous sections and framing as required to complete the *Work* and as indicated in the *Canadian Institute for Steel Construction (CISC) - Handbook of Steel Construction* for applications where framing and supports are not explicitly specified in this section.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Division 01.
- .2 Coordination:
 - .1 coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
 - .2 coordinate installation of anchorages and steel weld plates and angles for casting into concrete. Supply setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry.

1.5 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for *Project* in accordance with requirements of Division 01. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
- .3 Shop Drawings: Submit Shop Drawings for work of this Section in accordance with Division 01. In addition to minimum requirements indicate following:
 - .1 large scale details of members, materials and connections.
 - .2 jointing details.
 - .3 methods of setting, sealing, securing, anchorage.
 - .4 field connections.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
 - .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.
- .2 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.
- .3 Welding:
 - .1 Provide welding in accordance with CSA W59-M performed by a fabricator and mechanics fully approved by the Canadian Welding Bureau as specified herein.
 - .2 Ensure fabricator is fully certified by Canadian Welding Bureau for fusion welding of steel structures to CSA W47.1 and for fusion welding of aluminum to CSA W47.2.
- .4 Licensed Professionals: Employ a professional structural engineer carrying a minimum \$2,000,000.00 professional liability insurance and registered in the Province of Ontario in accordance with requirements of Division 01 to:
 - .1 be responsible for full assemblies and connections
 - .2 be responsible for determining sizes, joint spacing to allow thermal movement and loading of components in accordance with applicable codes and regulations.
 - .3 be responsible for production and review of Shop Drawings.
 - .4 inspect work of this Section during fabrication and erection.
 - .5 stamp and sign each Shop Drawing.
 - .6 Provide site administration and inspection of this part of The Work.
- .5 Certification:

- .1 Where metal fabrications require engineering design, submit certification from a registered professional structural Engineer specified in this Section, stating structure is capable of supporting its own weight and specified live loads.
- .6 Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Coordinate deliveries to comply with construction schedule and arrange ahead for strategic off-the-ground, undercover storage locations. Do not load areas beyond designed limits.
 - .2 Handle and store metal materials at job to prevent damage to other materials and to adjacent construction.
- .2 Storage and Handling Requirements: Handle components with care, and Provide protection for surfaces against marring or other damage. Ship and store members with cardboard or other resilient spacers between surfaces. Use lifting chokers of material which will not damage surface of metal members.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 The Work of this section that functions to resist forces imposed by dead and live loads shall conform to latest requirements of OBC and those of jurisdictional authorities.
- .2 Design and Performance Requirements:
 - .1 Architectural Drawings and details are diagrammatic and are only intended to show design concept, aesthetics, interfacing requirements, configuration, components and arrangements. They are not intended to identify or solve completely problems of thermal and structural movements, assembly framing, engineering design, fixings and anchorages.
 - .2 Design work of this Section to withstand within acceptable deflection limitations, specified tolerances in vertical and horizontal planes, its own weight, forces applied by movements of building structure and attached adjacent components, and maximum design loads due to pressure and suction of wind, snow, ice, rain and hail.
 - .3 Design load bearing structures in accordance with the requirements of the OBC and provide miscellaneous steel supports, connections and anchors to suit design. Conform to the requirements of CAN/CSA-S16.1 and CAN/CSA-S136.
 - .4 Ensure metal fabrications conform to Class 1, Class 2 and Class 3 as defined in NAAMM AMP 555, paragraph 8.3 of Section 8, Quality Control or Assurance and as follows:
 - .1 Class 1 Workmanship: Items that are exposed to view in finished spaces in completed Work.
 - .2 Class 2 Workmanship: Items that are exposed to view in utility areas of the completed Work.
 - .3 Class 3 Workmanship: Items that are concealed from view in the completed Work.
 - .5 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of the same material, colour and finish as the base material on which they occur.

- .6 Welding of any structural component related to work of this Section shall be executed by a fabricator having certification in accordance with Division 3, CSA W47.1.
- .7 Fabricate components carefully and accurately to enable erection within required limits so as not to induce excessive stresses, deflection, or distortion into the structure. Do not allow contact between dissimilar materials. Finished components to be rigid, free from discolouration and marks.
- .8 Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
- .9 Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.2 MATERIALS

.1 Steel:

- .1 Structural Shapes, Plates, and similar components.: New material conforming to CSA G40.20 and CSA G40.21, Grade 300W.
- .2 Hollow Structural Sections: New material conforming to CSA G40.20 and CSA G40.21, Grade 350W, Class H.
- .3 Uncoated, Cold-Rolled Steel Sheet: ASTM A1008/A 1008M, structural steel, Grade 170, new material, unless another grade is required by design loads; exposed.
- .4 Uncoated, Hot-Rolled Steel Sheet: ASTM A1011/A 1011M, structural steel, Grade 205, new material, unless another grade is required by design loads.
- .5 Steel Pipe:
 - .1 Handrails: Conforming to ASTM A53/A53M, Type E or S, Grade A or B, Standard Weight, Schedule 40 and Schedule 80, new material.
 - .2 Bumpers and Bollards: Conforming to ASTM A53/A53M, Schedule 80, new material.
- .6 Steel Tubing: ASTM A500, cold-formed steel tubing.
- .7 Galvanized Sheet Steel: 0.91 mm (20 ga) core thickness commercial quality to ASTM A653M, Grade A, with Z275 (G90) zinc coating designation to ASTM A653M
- .8 Hardware: Hot dipped galvanizing with minimum zinc coating of 600 g/m² in accordance with requirements of ASTM A153/A153M.

.2 Aluminum:

- .1 Aluminum Extrusions: ASTM B221M size accurately formed as shown on *Drawings*, extruded aluminum alloy AA-6063- T5 or T6.
- .2 Aluminum Plate and Sheet: ASTM B209M, Minimum thickness 3 mm (1/8"); of type and characteristics to match finished extrusions.
- .3 Structural aluminum: to CSA HA series - M, Type 6061-T6, clear anodized.

2.3 ACCESSORIES

- .1 Welding Materials: Conforming to CSA W48.1-M and CSA W59-M.
- .2 Fasteners: Select fasteners for type, grade, and class required. Supply each type and size of bolt and nut of same manufacturer and of same lot.

- .1 High Strength Bolts: *Supply* bolts, nuts and washers conforming with ASTM A325M. *Supply* each type and size of bolt and nut of same manufacture and of same lot.
- .2 Bolts: ASTM A325/A 325M, Property Class 4.6, Heavy, hexagon head high strength structural bolts, of standard size, of lengths required for thickness of members joined and for type of connection.
- .3 Stainless Steel Bolts: To suit applications and conforming to ASTM F738M.
- .4 Nuts: ASTM A563/A 563M, Heavy hexagon semi-finished nuts.
- .5 Stainless Steel Nuts: ASTM F836M, AISI Type 304 to suit applications.
- .6 Washers: ASTM F844 and ASME B18.22M, Flat and smooth hardened washers, quenched and tempered to suit applications. For general use bolt, nut and stud application to provide increased bearing surfaces, spacing and to prevent galling. Provide AISI Type 304 stainless steel washers at exterior locations.
- .3 Butyl Tape: AAMA 800, extruded, non-drying, non-skinning, non-oxidizing, reinforced, polyisobutylene butyl tape of sufficient width and thickness, minimum 0.118 inch (3 mm) thick.
- .4 Separator Sheet: ASTM D1330, 0.079 inch (2 mm) thick neoprene sheet.
- .5 Cementitious Grout (Interior Applications Only):
 - .1 ASTM C1107, Grade B and C, pre-mixed, high strength, maximum bearing capacity, non-shrink, cementitious aggregate grout. Acceptable *Products*:
 - .1 'Sika Grout 212' by Sika Canada Inc.,
 - .2 'Non Shrink Structural Grout - Dry Pack Grout' by Euclid Chemical Company
 - .3 'Sealtight CG 86 Construction Grout' by W.R. Meadows.

2.4 FABRICATION

- .1 Fabricate each item of work of this Section in accordance with following general requirements:
 - .1 members square and straight.
 - .2 members plumb and true.
 - .3 joints accurately and tightly fitted.
 - .4 intersecting members in true, flush planes.
 - .5 fasteners concealed.
 - .6 steel connections.
- .2 Fabricate, fit and assemble work in shop where possible. Where shop fabrication is not possible, make trial assembly in shop.
- .3 *Provide* hangers, rods, bars, bolts, anchors, brackets, rivets, bearing plates and bracing, fitting, drilling, stopping, soldering, as required for a complete assembly.
- .4 Insulate dissimilar metals to prevent galvanic corrosion.
- .5 *Provide* exposed metal fastenings and accessories of same material, texture, colour and finish as base metal to which they are applied or fastened.
- .6 Welding:
 - .1 Weld connections unless otherwise indicated.
 - .2 Should there be, in the opinion of *Consultant* or Inspection Company, doubt as to adequacy of welds, they shall be tested for efficiency and any work not meeting Standards be removed and replaced with new work satisfactory to *Consultant*.

- .3 Carry out welding in accordance with following standards:
 - .1 CSA W48-M - for Electrodes (If rods are used, only coated rods are allowed).
 - .2 CSA W59-M - for design of connections and workmanship.
 - .3 CAN/CSA W117.2 - for safety.
- .4 Thoroughly clean welded joints and steel exposed for a sufficient space to properly perform welding operation. Ensure welds exposed to view and finish painted are continuous and ground smooth.
- .7 Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- .8 Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- .9 Galvanize following members:
 - .1 members exposed to elements in final location;
 - .2 members embedded on exterior side of exterior walls;
 - .3 members embedded in concrete;
 - .4 members specified in this Section or noted on Drawings.

2.5 FINISHES

- .1 Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- .2 Unless otherwise indicated, galvanize metal fabrication items and supports at exterior locations; prime paint at interior locations.
- .3 Shop Primers: Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
 - .1 Clean steel to SSPC SP6 and remove loose mill scale, weld flux and splatter. Clean surfaces to be field welded; do not paint.
 - .2 Non-galvanized steel: Conforming to CAN/CGSB-1.40.
 - .3 Galvanized steel: in accordance with CAN/CGSB-85.10.
- .4 Galvanizing Repair Paint: ASTM D520, Type III and CAN/CGSB-1.181, VOC compliant, high zinc-dust content paint for re-galvanizing welds in galvanized steel containing not less than 93% zinc dust by weight and compatible with topcoat. Conform to requirements of Section 09 91 00.
- .5 Metal Filler: VOC compliant, polyester based metal filler designed for use over iron and steel substrates.
- .6 Field Applied Steel Primer: 1 coat of Fast-curing, lead- and chromate-free, universal modified-alkyd primer conforming to Section 09 91 00. Minimum DFT: 0.025 mm (1 mil).
- .7 Dielectric Separator: Acid and alkali resistant isolation coating to Provide dielectric separation between masonry and metals. Provide best grade, quick drying, non-staining alkali resistant asphalt utility enamel by approved manufacturer to Provide dielectric separation and which will dry to be tack-free and able to withstand high temperatures.
 - .1 Bituminous Paint: ASTM D1187, Type I or II, VOC compliant, brush or spray grade, non-fibred, asbestos free, liquid asphalt type emulsion.
- .8 Aluminum Surfaces:
 - .1 Finish (Concealed locations): Utility Aluminum mill finished

- .2 Finish (Exposed locations): Clear anodized coating AA-M12C22A31 (Architectural Class II), AAMA 611, Minimum 0.4 mils coating thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions:
 - .1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

3.2 ERECTION

- .1 Erect work of this Section square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .2 Do welding work in accordance with CSA W59 unless specified otherwise.
- .3 Securely anchor work of this Section and rivet, weld or bolt to structural framing of the building. Where secured to concrete, *Provide* bolts for setting in concrete. *Provide* expansion bolt supports to masonry.
- .4 *Provide* necessary fitting, setting and cutting required in connection with the fitting of work of this Section to other parts of *The Work*.
- .5 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .6 Supply components for work by other trades in accordance with shop drawings and schedule.
- .7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.

3.3 FINISHING

- .1 Field Painting: Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up with matching paint, shop primer damaged during transit and installation.
- .2 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.4 CLEANING

- .1 On completion of installation, carefully clean metal work. Remove surplus materials, rubbish, tools and equipment.

3.5 SCHEDULES

- .1 Unless otherwise indicated provide metal fabrication items as detailed.
- .2 SUPPORTS FOR OVERHEAD OPENINGS.
 - .1 Provide HSS, channel framing and 6 mm plate steel closures to profile as indicated.
 - .2 Provide inside jamb extensions, centre spring mount and motor supports in accordance with the manufacturer's instructions.
- .3 SUPPORTS FOR ARCHITECTURAL WOODWORK ELEMENTS.

- .1 Custom fabricate supports for architectural woodwork elements, using steel shapes and plates, as required to produce work of adequate strength and durability conforming to AWMAC requirements.
- .2 Use proven details of fabrication, as required, to achieve proper assembly and alignment of the various components of the work.
- .3 *Provide* miscellaneous steel items required as part of *The Work* of Section 06 40 00 including but not limited to valance supports, vanity support brackets, countertop supports etc.
- .4 MISCELLANEOUS SECTIONS AND FRAMING
 - .1 Supply and install support elements and framing for all miscellaneous items. Construct supports from rolled steel sections assembled by welding.
 - .2 Design supports to withstand, within acceptable deflection limitations, their own weight, weight of items to be supported, loads imposed by motion of supported items, where applicable, and all live loads, static and dynamic which might be applied to supported items in course of their normal function. Design supports with a safety factor of 3 or acceptable Limit States Design approach.
 - .3 Provide concealed support elements or framing as required for the following items:
 - .1 Provide miscellaneous steel sections which are not shown or identified on Drawings, or specified under another Section of Specifications
 - .2 Where items are required to be built into masonry or concrete supply such members to respective Sections.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* rough carpentry including but not limited to following:
 - .1 framing with dimension lumber.
 - .2 wood blocking
 - .3 plywood backing panels.
 - .4 preservative treatment of wood.
 - .5 fire retardant treatment of wood
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for *Project* in accordance with requirements of Division 01. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
 - .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems.
- .2 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Storage and Handling Requirements:
 - .1 Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.
 - .2 Deliver interior wood materials that are to be exposed to view only after building is enclosed and weatherproof, wet work other than painting is dry, and HVAC system is operating and maintaining temperature and humidity at occupancy levels.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
- .2 Design and Performance Requirements:
 - .1 Do not use Products containing added urea formaldehyde.
 - .2 Visual Characteristics: Measure knots, checks, shakes and slope of grain in visually graded lumber in accordance with ASTM D245 with exceptions as noted under NLGA 120d.
 - .3 For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes
 - .4 Grading:
 - .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board conforming to the Standard Grading Rules for Canadian Lumber published by the National Lumber Grades Authority.
 - .2 Plywood and wood based composite panel construction identification: by grade mark in accordance with applicable CSA standards.
 - .3 Preservative Pressure-Treated and Fire-Retardant-Treated Wood and Plywood identification: by grade mark in accordance with the Canadian Wood Preservers Bureau and applicable ULC standards.
 - .4 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board
 - .5 *Provide* roof sheathing bearing manufacturer's grading stamp for identification.

2.2 MATERIALS

- .1 Lumber:
 - .1 Unless specified otherwise, use No. 2 White Pine, No. 2 Red Pine, or No. 1 Construction S-P-F, lumber with moisture content of 19% or less, kiln dried, free from sap, shakes, splits, knots and other defects in accordance with following standards:
 - .1 CAN/CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .2 Furring, blocking, nailing strips, grounds, rough bucks, [cants,] curbs, fascia backing and sleepers:
 - .1 Board sizes: "standard" or better grade.
 - .2 Dimension sizes: "standard" light framing or better grade.

- .3 Post and timbers sizes: "standard" or better grade.
 - .3 Appearance Lumber: Graded in accordance with NLGA Para 125.
 - .4 Studs: Conforming to NLGA Para 121.
 - .5 Light Framing: Conforming to NLGA Para 122.
 - .6 Structural Light Framing: NLGA Para 124.
 - .7 *Consultant* reserves right to select species and appearance grades to suit design requirements.
- .2 Panels:
- .1 Interior Locations: minimum 19 mm (3/4") thick, unless otherwise indicated.
 - .1 Douglas Fir Plywood: Conforming to CSA O121-M, G1S or G2S.
 - .2 Canadian softwood plywood: Conforming to CSA O151; G1S or G2S.

2.3 ACCESSORIES

- .1 Rough Hardware and Fastening Accessories:
- .1 *Supply* rough hardware to frame and fix rough carpentry including but not limited to bolts, anchors, nails, expansion shields and other fastenings required.
 - .1 Wire Nails, Spikes and Staples: Conforming to CSA B111.
 - .2 Provide spiral thread nails except as indicated otherwise.
 - .3 Bolts: ASTM A307, minimum 12 mm (1/2") complete with nuts and washers.
 - .4 Connecting Hardware: Pre-engineered, pre-drilled, purpose made galvanized joist hangers, framing fasteners and anchors meeting structural requirements and pre-approval.
 - .5 Connection Steel: Mild structural steel, conforming to CSA G40.20/G40.21, Grade 300W.
 - .6 Proprietary fasteners (toggle bolts, expansion shields, screws, organic fibre plugs etc.): recommended for purpose by manufacturers.
 - .7 If stainless steel fasteners are used, use only Type 316 fasteners.
- .2 Preservative Treatments:
- .1 Fire-Retardant-Treated Wood and Plywood:
 - .1 Maximum moisture content: kiln dried, 19%. Do not use material that is warped or does not comply with requirements for untreated material.
 - .2 Surface Burning Characteristics: Conforming to CAN/ULC-S102 and UL FR-S rating.
 - .1 Flame Spread: ≤ 25
 - .2 Smoke Developed: ≤ 50
 - .3 Treatment:
 - .1 Provide chemical treatment acceptable to authorities having jurisdiction and containing no arsenic or chromium from one of the following manufacturers:
 - .1 Dircon; www.dricon.com
 - .2 FireFree; www.firefree.com
 - .2 Do not resurface or rip fire treated wood if it affects the ULC Label.
 - .3 For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

- .4 Application: Provide fire-retardant-treatment for following wood elements and other items indicated on Drawings:
 - .1 Plywood backing panels.
- .3 Adhesives: waterproof in accordance with CSA O 112 and CAN/CGSB-71.26 requirements with VOC limit acceptable to authorities having jurisdiction.

PART 3 - EXECUTION

3.1 VERIFICATION

- .1 Site Verification of Conditions:
 - .1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

3.2 PREPARATION

- .1 Treat surfaces with wood preservative or fire-retardant treatments before installation.
- .2 Coordinate with other Sections providing blocking, nailing strips and trims as required for installation of work.

3.3 INSTALLATION

- .1 Properly frame together parts of the work with members accurately cut to size, closely fitted, well spiked, and erected in a substantial manner, plumb, level, square and true to dimension.
- .2 Locate joints overbearing or supporting surfaces.
- .3 *Provide* running members full length wherever possible.
- .4 Design for expansion and contraction of the materials.
- .5 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .6 *Provide* fasteners and rough hardware for a rigid and secure installation. In addition to mechanical fasteners, place continuous adhesive bead where appropriate in accordance with manufacturer's instructions.
- .7 Countersink bolts where necessary to provide clearance for other work.
- .8 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .9 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.
- .10 Mix intumescent paint coating Product to manufacturer's recommendations. Do not thin or strain. Apply primer and paint coating providing fire resistant barrier in accordance with manufacturer's recommendations to achieve requirements of authorities having jurisdiction.
- .11 Miscellaneous Interior Carpentry:
 - .1 *Provide* plywood, blocking, furring, nailers, rough carpentry, grounds and nailing strips, as required for proper installation and to support miscellaneous work indicated on *Drawings* to meet design requirements.

- .2 This non-exhaustively includes following: support for fascia, composite wood panels, wall mounted equipment, crash rails, bumpers and wood blocking required for wall-mounted items.
- .12 Equipment Mounting Panels:
 - .1 *Provide* "fire treated" plywood.
 - .2 *Install* wood panels required for mechanical, electrical and communication trades for mounting of items including but not limited to control boards, panel boards, pull boxes, splitters, switches, wall mounted switch gear, junction boxes, electrical cabinets, data control equipment, disconnect switches, fire alarm control equipment, lighting control equipment, sound/communication equipment and other similar devices.
 - .3 *Provide* 19 mm (3/4") thick exposed plywood backboard panels in one piece screw-fastened and securely mounted to wall surfaces by use of fire-retardant treated wood strapping.
 - .4 Ensure panel size and mounting height suit mechanical and electrical requirements and are acceptable to respective *Consultants*. Apply to all surfaces and edges of plywood panels 1 coat of fire retardant wood preservative to surfaces and edges of plywood panels.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by rough carpentry installation.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 *Work Included: Provide architectural woodwork including but not limited to following:*
 - .1 casework and associated hardware.
 - .2 decorative laminate countertops.
- .2 *Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.*

1.3 REFERENCES

- .1 Definitions:
 - .1 Architectural Cabinetry:
 - .1 In the context of architectural cabinetry, the following definitions apply in accordance with North American Architectural Woodwork Standards (NAAWS), Section 10 and amended as follows:
 - .1 Exposed Surfaces: Defined as all surfaces exposed to view in open casework or behind transparent doors. These include:
 - .1 Surfaces visible when doors and drawers are closed, including knee spaces
 - .2 Underside of cabinet bottoms over 1067 mm (62") above finished floor level, including cabinet bottoms behind light valances and bottom edge of light valances.
 - .3 Cabinet tops under 2032 mm (80") above finished floor, or if 2032 mm (80") and over and visible from an upper building level or floor.
 - .4 Front edges of stretchers, ends, divisions, tops and bottoms.
 - .5 Sloping tops of cabinets that are visible.
 - .6 Shelves (including edgebanding),
 - .7 Divisions and partitions,
 - .8 Interior face of ends (sides), backs, and bottoms (including pull-outs). Also included are the interior surfaces of cabinet top members 914 mm (36") or more above the finished floor.
 - .9 Interior face of door and applied drawer fronts.
 - .2 Semi-Exposed Surfaces: Defined as those interior surfaces only exposed to view when doors or drawers are opened. These include:
 - .1 Tops and bottoms shelves, including front edgebanding (front edge is considered exposed)
 - .2 Divisions and partitions (front edge is considered exposed)

- .3 Interior face of ends (sides), backs, and bottoms (including pull-outs). Also included are the interior surfaces of cabinet top members 914 mm (36") or more above the finished floor
 - .4 Drawer sides, sub-fronts, backs, and bottoms.
 - .5 The underside of cabinet bottoms between 610 mm (24") and 1067 mm (42") above the finished floor.
 - .6 Security and dust panels or drawer stretchers.
 - .7 The faces of cabinet ends of adjoining units that butt together.
- .3 Concealed Surfaces: Defined as those exterior or interior surfaces that are covered or not normally exposed to view. These include:
- .1 Toe space unless otherwise specified.
 - .2 Sleepers, stretchers, and solid sub-tops
 - .3 The underside of cabinet bottoms less than 610 mm (24") above the finished floor
 - .4 The flat tops of cabinets 2032 mm (80") or more above the finished floor, except if visible from an upper floor or building level.
 - .5 The three non-visible edges of adjustable shelves.
- .2 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
- .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Division 01.
- .2 Coordination:
- .1 Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that architectural woodwork and related items can be supported and installed as indicated.
 - .2 Perform pre-wiring and partial mounting of electrical and audio/visual equipment and concealed wiring required. Finalize location of outlets and similar items with Consultant prior to installation.
 - .3 Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings.
 - .4 Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - .5 Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.

1.5 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for *Project* in accordance with requirements of Division 01. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.

- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
- .3 Shop Drawings:
 - .1 Submit Shop Drawings indicating material characteristics, details of construction, connections and relationship with adjacent construction.
 - .2 Indicate locations and sizes of cutouts and holes for plumbing and electrical fixtures, lavatories and similar items required in architectural woodwork; coordinate with appropriate trades.
 - .3 Clearly indicate material being supplied and show connections, attachments, reinforcing, anchorage and location of exposed fastenings in accordance with NAAWS Section 1.
 - .4 Field Measurements: Take field measurements prior to preparation of Shop Drawings and fabrication to ensure proper fitting of work. Do not proceed with fabrication until Shop Drawings have been reviewed.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
 - .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.
- .2 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver and Acceptance Requirements:
 - .1 Do not deliver finished Products during rainy or damp weather.
 - .2 Do not deliver Work of this Section until building and storage areas are sufficiently dry to ensure Products will not be damaged by changes in relative humidity and moisture content. Deliver, store and handle Products of this Section in accordance with NAAWS Section 2.
 - .3 Do not deliver and Install damaged Products. Replace in accordance with requirements of this Section.
 - .4 Storage and Handling Requirements: Cover and protect finished surfaces with heavy Kraft paper and other acceptable means. Put in cartons for protection. Do not remove protective covers until immediately prior to final cleaning.

1.8 SITE CONDITIONS

- .1 Ambient Conditions: Ensure conditions conform to requirements of NAAWS Section 2 and moisture contents of wood for interior locations at time of installation are at established Optimum Moisture Content and Optimum Indoor Relative Humidity outlined in NAAWS Section 2.

1.9 WARRANTY

- .1 Warrant work of this Section for period of 3 years from Substantial Performance of the Work against defects and deficiencies in accordance with General Conditions of the Contract. Promptly correct defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to: delamination of plastic laminate, opening of seams, warpage and extensive colour fading.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Provide work of this Section in accordance with North American Architectural Woodwork Standards (NAAWS), except as specified otherwise herein. Any reference to grades and terminology in this Section to be as defined in "NAAWS" and by reference are made a part of this Section. Requirements of this Section govern and modify NAAWS.
 - .2 Fire-Test-Response Characteristics:
 - .1 Flame-spread index shall be in accordance with OBC requirements when tested according to CAN/ULC-S102
 - .2 Where fire-retardant materials are indicated, Provide materials with specified fire-test-response characteristics as determined by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency on surfaces of materials that will be concealed from view after installation
- .2 Design and Performance Requirements:
 - .1 Architectural Drawings and details are diagrammatic and are only intended to show design concept, aesthetics, interfacing requirements, configuration, components and arrangements. They are not intended to identify or solve completely problems of thermal and structural movements, assembly framing, engineering design, fixings and anchorages.
 - .2 Ensure millwork casework (e.g. countertops, wall cabinets, cabinet drawers and similar items) are capable of supporting structural loads without deflection in accordance with Casework Integrity Tests in Appendix A of AWMAC- NAAWS Standard Manual of current edition at time of bidding.
 - .3 All composite wood products and laminating adhesives used in millwork shall not contain added urea-formaldehyde resins;
 - .4 All cabinets shall be flush overlay construction;
 - .5 Design millwork so that no sharp edges are exposed, provide minimum 25 mm radiused corner to countertops;
 - .6 Incorporate all required mechanical, electrical and communication services into millwork so that wires and pipes are hidden from view, provide access panels to all services to allow for future adjustment;
 - .7 All architectural woodwork hardware shall be stainless steel of durable quality to meet standards of AINSI/BHMA grade 1 Cabinet Hardware.
 - .8 All door, drawer and other exposed millwork edges shall have applied appropriately sized PVC edge strip, heat applied.
 - .9 Plastic laminate-to-plastic laminate edges are not permitted.

- .10 Provide marine-grade plywood to all bottoms of sink cabinet boxes and areas that may come into contact with water.
- .11 Minimum nominal thickness and material for cabinet components and shelf deflection, type of materials, thicknesses, span width and total load distribution: In accordance with AWMAC-NAAWS Standard Manual Section 10, current edition.
- .12 Minimum nominal thickness and material for cabinet components and shelf deflection, type of materials, thicknesses, span width and total load distribution: In accordance with NAAWS Section 10.
- .13 Fire Retardant Treated Materials:
 - .1 Where fire-retardant-treated materials are indicated or required by authorities having jurisdiction, use materials impregnated with fire-retardant chemicals by pressure process or other means acceptable to Consultant to produce Products with following fire-test-response characteristics:
 - .1 Flame-spread index: ≤ 25 when tested according to CAN/ULC-S102 and in accordance with OBC requirements.
 - .2 Provide fire retardant pressure treatment complying with CSA O80-C20 for lumber and O80-C27 for plywood.
 - .3 Provide ULC or WHI label for treated lumber and plywood as received from the pressure treating plant.
 - .4 For exposed items indicated to receive transparent finishes, do not use chemical formulations that contain colorants or that bleed through or otherwise adversely affect finishes.
 - .5 Pressure treat lumber for fire retardance prior to final milling. Pressure treat plywood for fire retardance to receive a natural finish before face veneer is applied and apply facings not thicker than 1.0 mm (6.2 mils) to treated cores.
 - .6 Provide quality of finished Work of equal standard to that of untreated material. Minimize reworking of fire retardant treated wood. Re-treat surfaces which have been exposed by cutting, trimming or boring with fire retardant chemicals before installation, to requirements of authorities having jurisdiction.

2.2 MATERIALS

- .1 Softwood Lumber: Ontario White Pine, Yellow Pine or other Pine species meeting CAN/CSA O141 and National Lumber Grade Authority (NLGA) requirements.
- .2 Hardwood Lumber: Premium Grade Maple Meeting NHLA requirements.
- .3 Framing Lumber (Concealed Framing): Softwood or hardwood lumber as specified herein of uniform grain and colour, free from sap, shakes, knots, splits and other defects with grade marked by NLGA and meeting CAN/CSA O141 requirements as applicable. No cross grain permitted. *Provide* concealed wood of most appropriate grade required to satisfy fabrication, utility and structural requirements.
- .4 Architectural Lumber (Exposed framing, solid members and trim): Clear, straight, kiln dried hardwood lumber as specified herein, of species indicated on *Drawings*. *Provide* lumber kiln-dried to moisture content recommended by NAAWS, free from blemishes that would be apparent after finish is applied. Where species are not indicated on *Drawings*, *Provide*:
 - .1 Transparent Finish: Maple Plain cut, quarter cut or flat cut, premium grade hardwood or softwood matched for compatibility of grain and colour and complying with requirements of NAAWS Section 3. Species: To be selected by *Consultant* conforming to following requirements:

- .1 Natural characteristic limitations: Premium grade characteristics as defined by NAAWS for species selected.
- .2 Opaque Finish: Natural Birch Plain cut, quarter cut or flat cut, premium grade hardwood or softwood matched for compatibility of grain and colour and complying with requirements of NAAWS Section 3. Species: To be selected by *Consultant* conforming to following requirements:
 - .1 Natural characteristic limitations: Premium grade characteristics as defined by NAAWS for species selected.
- .5 Panel Products: Conform to AWMAC NAAWS Section 4.
 - .1 Medium Density Fibreboard Core (MDF): All wood core substrates to be MDF unless used in areas subject to moisture. *Provide* MDF *Products* manufactured from 100% recycled materials, without the use of added formaldehyde resins and with following characteristics:
 - .1 Minimum density: 770 kg/m³ (48 lb. /cu ft.)
 - .2 Surface characteristics: In accordance with ANSI/NPA A208.2
 - .3 Grade: Minimum 155.
 - .4 Finish and Texture: To match *Consultant's* sample
 - .5 Where indicated on Drawings or required by authorities having jurisdiction, provide industrial grade MDF certified to meet Class 1 surface burning characteristics of ASTM E84, CAN/ULC-S102 and UL 723 (Maximum Flame Spread ≤25;Maximum Smoke Developed:≤200.)
 - .6 Acceptable Products:
 - .1 Medium Density Fibreboard Core (MDF):
 - .1 Decorative panels, "Meditate II®" by Sierra Pine Ltd; www.sierrapine.com or
 - .2 approved equivalent Products manufactured by Flakeboard Company Limited.; www.flakeboard.com,
 - .3 Uniboard Canada Inc.; www.uniboard.com; or
 - .4 Tafisa Canada and Company, Ltd.; www.tafisa.ca.
 - .2 Veneer Core Plywood: *Provide* exterior grade, veneer core plywood at locations where sinks are scheduled to be installed and at other locations indicated on *Drawings*. Where indicated on *Drawings* or required by authorities having jurisdiction, Provide fire-retardant treatment. Conform to NAAWS Section 4.
 - .1 Softwood plywood (rough framing and rough carpentry only):
 - .1 Premium Grade, Douglas Fir plywood - CSA O121, or Western Softwood Plywood - CSA O151 or Poplar plywood - CSA O153-M. *Provide* Grade G2S where exposed on two sides and Grade G/Solid where exposed on one side.
 - .2 Hardwood Plywood (wood cores): Conforming to ANSI/HPVA HP-1.
 - .1 Water-resistant plywood "PureBond™" by Columbia Forest Products; www.columbiaforestproducts.com or
 - .2 "HyBrid Panel – SkyPly" by Rosenburg Forest Products; www.rfpco.com
 - .3 Provide veneer core (plywood) for following applications:
 - .1 millwork cores subject to moisture (where sinks are indicated),
 - .2 cabinet bases in contact with floor,
 - .3 Other locations indicated on Drawings and Schedules.
 - .6 Facings:

- .1 Facing Adhesive: Adhesives shall be non-toxic, non-solvent glue to comply with AWMAC North American North American Architectural Woodwork Standards, Canadian 'Eco- Logo' program, CaGBC (Canada Green Building Council) as recommended by manufacturer, and containing no added urea-formaldehyde. Provide water-resistant adhesive for areas subject to moisture
- .2 Plastic Laminates (PLAM): *Provide* following types and thicknesses of high pressure, paper based, decorative laminates (HPDL) conforming to ANSI/NEMA LD3 and ANSI/NEMA LD3.1 and NAAWS Section 4:

Type	Description	Nominal Thickness
HGS	Horizontal – General Purpose	1.2 mm (0.048)
VGS	Vertical – General Purpose	0.7 mm (0.028")
HGP	Horizontal – Post-forming	1.0 mm (0.039")
VGP	Vertical – Post-forming	0.7 mm (0.028")
CLS	Cabinet Liner	0.5 mm (0.020")
BKH	Horizontal – Backer Sheet	1.2 mm (0.048")
BKV	Vertical – Backer Sheet	0.7 mm (0.028")

- .1 Colours and Finishes: To be selected by *Consultant* at a later date from plastic laminate manufacturer's full colour range (including solid, printed and wood look), texture and finish.
 - .1 Plastic Laminate Type 1 (PLAM1): Allow *Consultant* to select up to 2 colours and patterns at a later date from one of the following manufacturers.
 - .1 Formica Inc.; www.formica.com
 - .2 Nevamar Company, LLC; www.nevamar.com
 - .3 Wilsonart Canada; www.wilsonart.com
 - .4 Pionite by Panolam Surface Systems; www.panolam.com
- .7 Architectural Woodwork Hardware and Accessories: Provide hardware meeting or exceeding applicable ANSI/BHMA A156 Series (Grade 1) standards.
 - .1 Cabinet Door Hinges and Stays: Ensure cabinet hinge pin is not removable (tack weld or cap). *Provide* hinges complete with one-piece non-removable pin with tapered tips (Hospital Tips)
 - .1 Wood Door Hinges:
 - .1 Frameless Concealed Hinges (European Type): Self-closing concealed hinges with integrated soft close. Manufacturer's recommended number of hinges to suit door size and thickness.
 - .1 Opening angle: Minimum 160°, except Provide 110° at locations adjacent to walls to prevent wall damage.
 - .2 Acceptable Products: "Salice Concealed Hinges 200 and 300 Series" by Hafele; www.hafele.com or "Blum Concealed - Clip-Top Hinge" by Ric; www.richelieu.com or "Intermat 9943" or "Intermat 9956" by Hettich; www.hettich.com
 - .3 Cylinder Locks: *Provide* adjustable locking system with lock throw, orientation and size to suit cabinet size. Following products are acceptable: :

- .4 "Cylinder Module System; Model No. 232 Series" by Hafele; www.hafele.com complete with cam locks or deadbolt locks and cores as required to suit applications indicated.
- .2 Handles (Doors and Drawers):
 - .1 D-Pulls: Following products are acceptable:
 - .1 "Model No. 116.05 Series" by Hafele; www.hafele.com
 - .2 "Model No. BP221170; Contemporary Metal Pull - 221" by Richelieu
 - .3 Finish: to be selected at a later date.
- .8 Fastenings:
 - .1 Include necessary fastenings, anchors and accessories required for fabrication and erection of work of this Section.
 - .2 Fastenings include non-exhaustively: anchor bolts, machine bolts, toggle bolts, male/female bolts, lag screws, expansion shields, sleeves, brackets, washers and nuts.
 - .3 Only *Provide* exposed fasteners, where approved and shown on reviewed *Shop Drawings*, of same texture, colour and finish as base material on which they occur unless otherwise shown or noted.
 - .4 *Supply* bolts complete with washers and nuts required for complete installation. *Provide* lock washers where vibration may loosen bolted fastenings.
 - .5 Ensure thread dimensions are such that nuts and bolts fit without rethreading or chasing threads.

2.3 COMPONENTS

- .1 *Provide* premium grade quality for all architectural woodwork construction and finishing unless otherwise indicated.
- .2 Plastic Laminate Casework and Frames Construction: Conforming to **NAAWS Section 10** unless otherwise indicated.
 - .1 Casework Construction Type: Frameless construction with edge banded front edges
 - .2 Interface Style: Flush Overlay unless otherwise indicated.
 - .3 Exposed Surfaces Core, Semi-Exposed and Concealed Surfaces Core:
 - .1 Medium Density Fiberboard Core (MDF) unless otherwise indicated.
 - .4 Facings: per NAAWS Section 10,
 - .1 Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
 - .1 Horizontal Surfaces Other Than Tops: HGS
 - .2 Vertical Surfaces: VGS.
 - .3 Post formed Surfaces: Grade HGP.
 - .4 Edges: PVC or ABS edge banding matching laminate in colour, pattern, and finish. Solid colours are not acceptable.

- .1 case bodies: minimum 0.5 mm (0.0197") thick,
- .2 doors, drawer fronts, and false fronts: minimum 3 mm (1/8") thick.
- .3 Acceptable Manufacturers: Richelieu Hardware or Wilsonart or approved equivalent.
- .5 Plastic Laminate Finish: To be selected from manufacturer's full range at a later date.
- .2 Semi-Exposed Surfaces:
 - .1 Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS.
 - .1 Finish: Solid colour to match exposed surface finish
 - .2 Drawer Sides and Backs: High-pressure decorative laminate, Grade VGS.
 - .3 Drawer Bottoms: To match drawer sides.
 - .3 Concealed Surfaces Finish: BKV at vertical locations and BKH at horizontal locations; unless otherwise indicated.
- .3 Countertops and Backsplashes: Conforming to NAAWS Section 11 unless otherwise indicated.
 - .1 Cores: unless otherwise indicated, provide exterior grade veneer core plywood with non-telegraphing grain and Type II adhesive as specified herein.
 - .2 Plastic Laminate Countertops:
 - .1 Front Edge type: As noted on Drawings.
 - .2 Splash: As noted on Drawings..
 - .3 Laminate Material: Grade HGS
 - .1 Plastic Laminate Finish: To be selected from manufacturer's full range at a later date.
 - .4 Backer Sheet: backer sheet, Grade BKV, on underside of countertop substrate.

2.4 FINISHES

- .1 Field Touch-Up: Field touch-up is responsibility of installing trade. Architectural woodwork manufacturer is responsible for factory finishing. Field touch-up includes filling and touch-up of exposed job-made nail and screw holes, refinishing of raw surface resulting from job fitting, repair of job-inflicted scratches and mars and final cleaning up of finished surfaces.

2.5 FABRICATION

- .1 Fabricated components not meeting AWMAC North American Architectural Woodwork Standards, as specified herein, shall be replaced, reworked and refinished to approval of AWMAC at no additional cost to Owner.
- .2 Fabricate joints accurately fitted, coped where possible, and well glued up. Fabricate joints mitered to perfect fit and alignments carefully matched.
- .3 Fabricate finished woodwork in 1 piece where possible. Fabricate running members in the longest lengths obtainable.
- .4 Fabricate to conceal fastenings.
- .5 Fabricate exposed gables to match the required exposed finishes.

- .6 Set nails and countersink screws apply matching wood filler to indentations, sand smooth and leave ready to receive finish.
- .7 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .8 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
- .9 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- .10 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .11 Ensure adjacent parts of continuous facing work match in colour and pattern.
- .12 Apply facings to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface.
- .13 Apply backing sheet to reverse side of core of paneling work.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions:
 - .1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
 - .2 Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and back priming.
- .2 Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2 PREPARATION

- .1 Before installation, condition woodwork to average prevailing humidity conditions in installation areas.

3.3 INSTALLATION

- .1 Install Work of this Section in accordance with corresponding product section of the AWMAC NAAWS.
- .2 Grade: Install woodwork to comply with requirements for grade specified herein for fabrication of type of woodwork involved.
- .3 Assemble woodwork and complete fabrication at site to comply with requirements for fabrication specified herein.
- .4 *Install* woodwork level, plumb, true, and straight to a tolerance of 3 mm in 2400 mm (1/8" in 8'-0"). Shim as required with concealed shims.
- .5 Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts. Mitre exposed corners and butt joints.
- .6 Anchor woodwork to anchors or blocking built-in or directly attached to substrates to thoroughly fix and anchor *Work* of this Section into position. Secure with countersunk, concealed fasteners

and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated. Supply and install heavy duty fixture attachments for wall mounted cabinets.

- .7 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
- .8 Paneling: Anchor paneling to supporting substrate with concealed panel-hanger clips. Do not use face fastening, unless otherwise indicated.
- .9 Cabinets: *Install* without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - .1 *Install* cabinets with no more than 3 mm in 2400 mm (1/8" in 8'-0") sag, bow, or other variation from a straight line
 - .2 Maintain sequence matching of cabinets for cabinet facings.
 - .3 Fasten wall cabinets through back, near top and bottom, at ends and not more than 400 mm (16") o.c. with toggle bolts through metal backing or metal framing behind wall finish.
- .10 Installation of Architectural Woodwork Hardware:
 - .1 Install architectural woodwork hardware in accordance with AWMAC requirements and manufacturer's templates. Fit hardware accurately and securely in accordance with manufacturer's written instructions.
 - .2 Adjust architectural woodwork hardware to provide smooth operation and ensure clearances are maintained. *Provide* lubricants required and use in manner to ensure smooth function of hardware consistent with manufacturer's recommendations.
- .11 Mechanical and Electrical Fittings:
 - .1 *Provide* openings required to accommodate mechanical and electrical fittings as part of the *Work* of this Section and *Provide* a core sealant to protect counter cores which are exposed.
 - .2 Locate and *Install* lenses where indicated. Carefully align lenses, shown in continuous lines so that appear as straight lines. Mount lenses perfectly level or plumb. Lenses shall fit tightly without showing space or light leak between frame and lenses.
 - .3 Mechanical and electrical fittings and services will be provided as part of the *Work* of 21, 22 23, 26, 27 and 28.
- .12 Install required pocket doors and frames in accordance with manufacturer's directions.
- .13 Finishing:
 - .1 Prime unexposed surfaces including backs of fitments against walls and underside of fitments.
 - .2 Before priming, treat knots and sap streaks, with a coat of shellac and then prime with a wood primer.
 - .3 Shop finish natural finished wood surfaces.
 - .4 Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

3.4 ADJUSTING AND CLEANING

- .1 Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork.
- .2 Clean woodwork on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.
- .3 Clean, lubricate, and adjust moving and operating parts to function smoothly and correctly.
- .4 Fill and retouch nicks, chips and scratches. Replace unrepairable damaged items.
- .5 Adjust joinery for uniform appearance.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* general installations including but not limited to following:
 - .1 installation of pressed steel frames.
 - .2 installation of hollow metal doors.
 - .3 spot grouting of door frames in gypsum board partitions.
 - .4 installation of finish hardware.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them

1.3 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at *Project* site to review *Project* requirements and site conditions with pertinent parties. Conform to requirements of Division 01.

1.5 SUBMITTALS

- .1 Provide submittals in accordance with Division 01. Provide submittals including:
- .2 Product Data:
 - .1 Submit manufacturer's literature and data sheets for each type of material provided under this Section for Project in accordance with requirements of Division 01.

- .2 Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions.
- .3 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
- .4 Inspection Reports: After installation of fire-rated assemblies, submit inspection reports from an approved independent inspection and testing agency specified in this Section, certifying fire-rated assemblies comply with requirements of authorities having jurisdiction and applicable standards specified.

1.6 QUALITY ASSURANCE

- .1 Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- .2 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Ensure fire rated doors and frames are listed and labeled for ratings specified and noted by organization accredited by the Standard Council of Canada in conformance with CAN4-S104 and CAN4-S105, NFPA 80 and NFPA 252.
 - .2 Ensure doors and frames are labeled at manufacturing plant by means of metal tags or embossing. Site applied and stamped fire-labelling is not acceptable.

2.2 MATERIALS

- .1 Doors, Frames and Hardware: Refer to following Sections for *Products* to be installed as part of the work of this Section:
 - .1 Section 08 11 13, Steel Doors and Frames.
 - .2 Section 08 71 00, Finish Hardware.
- .2 Spot Grout (Metal Stud Partitions): High density setting-type taping, low shrinkage type compound.
 - .1 Acceptable Products:
 - .1 "Durabond 90 Compound" by CGC Inc.,
 - .2 "High Density 90 - ProRoc" by CertainTeed Canada Inc

- .3 Comparable *Products* from manufacturers listed herein will be considered provided they meet the requirements of this Specification, offering functionally, aesthetically equivalent products in Consultant's opinion and subject to Consultant's review.
- .3 Threshold Sealant: As recommended by installer in accordance with Section 07 92 00.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Site Verification of Conditions: Verify actual Site dimensions and location of adjacent materials prior to commencing the work of this Section. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- .2 Examine roughing-in, electrical power systems for embedded and built-in anchors to verify actual locations before frame installation.
- .3 Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- .4 Proceed with installation only after unsatisfactory conditions have been corrected.
- .5 Notify Consultant in writing of any conditions which would be detrimental to the installation work of this Section. Commencement of work constitutes Contractor's acceptance of previously completed work.

3.2 PREPARATION

- .1 Hollow Metal Doors and Frames:
 - .1 Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
 - .2 Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
 - .1 Squareness: +/- 1.6 mm (1/16"), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - .2 Alignment: +/- 1.6 mm (1/16") measured at jambs on a horizontal line parallel to plane of wall.
 - .3 Twist: +/- 1.6 mm (1/16"), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - .4 Plumbness: +/- 1.6 mm (1/16"), measured at jambs on a perpendicular line from head to floor.
 - .3 Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 GENERAL INSTALLATION REQUIREMENTS

- .1 Install work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- .2 Fire-rated Doors and Frames:
 - .1 Install fire-rated labeled doors and frames in accordance with manufacturer's printed instructions and NFPA 80.
 - .2 Verify labeled doors and frames are placed in their designated openings. Review, inspect and certify where required by authorities having jurisdiction.

3.4 INSTALLATION OF HOLLOW METAL FRAMES

- .1 Install hollow metal frames of size and profile indicated. Comply with HMMA 840 and manufacturer's instructions.
- .2 Brace frames rigidly in position while being built in. *Provide* vertical supports and horizontal spreaders to prevent deflection and warping.
- .3 Allow for deflection to prevent structural loads from being transmitted to frame.
- .4 *Provide* batt insulation to completely fill pressed steel frames of exterior doors and adjacent cavities.
- .5 Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - .1 At fire-protection-rated openings, install frames according to NFPA 80.
 - .2 Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - .3 Install frames with removable glazing stops located on secure side of opening.
 - .4 Install door silencers in frames before grouting.
 - .5 Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - .6 Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - .7 Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.
- .6 Secure anchorages and connections to adjacent construction:
 - .1 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
 - .2 Provide two anchors for rebate opening heights up to and including 1500 mm (5') and one additional anchor for each additional 760 mm (30") of height or fraction thereof, unless otherwise indicated in Contract Documents.

- .3 Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
- .7 Metal-Stud Partitions
 - .1 New construction:
 - .1 Solidly pack mineral-fiber insulation behind frames.
 - .2 Anchorages:
 - .1 Provide frame Products installed in steel stud and drywall partitions with 20 ga. steel snap-in or "Z" stud type anchors.
 - .2 Supply frame anchors to gypsum board installers with directions for installing steel door frames in gypsum board partitions.
 - .3 Locate anchor preparations and guides immediately above or below intermediate hinge reinforcing and directly opposite on strike jamb. Provide each preparation with 16 ga. anchor bolt guides.
 - .4 Provide anchor bolts and expansion shell anchors for above preparations by the Subcontractor responsible for installation.
 - .3 Spot Grout: Coordinate installation of frames with Section 09 21 16 to allow for spot grouting of frames.
 - .1 Provide spot grout to increase rigidity of frame and improve resistance to frame rotation caused by weight of door.
 - .2 Comply with manufacturer's recommendations for surface preparation, cleaning, forming, mixing, placement and curing of grout.
 - .3 Proportion spot grout as follows: 1 part hardwall plaster to not more than 2-1/2 parts Perlite by weight, with enough water added for 'hand pack' consistency and use.
 - .4 Provide spot grout at strike and hinge side jambs of frames set in gypsum board partitions. Do not use pumped slurry method to perform spot grouting.
 - .5 Provide spot grout at strike jambs after studs are installed but before gypsum boards are erected.
 - .6 After grouting is applied, immediately insert gypsum panels into jamb and attach to framing. Do not terminate gypsum board against trim.
 - .2 In-Place Gypsum Board Partitions: Secure frames in place with post installed expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

3.5 INSTALLATION OF HOLLOW METAL DOORS

- .1 Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - .1 Non-Fire-Rated Standard Steel Doors:
 - .1 Jambs and Head: 3 mm (1/8").
 - .2 Between Edges of Pairs of Doors: 3 mm (1/8).
 - .3 Door Bottom:
 - maximum 19 mm (3/4") to unfinished floor
 - maximum 16 mm (5/8") to finished floor unless indicated to be undercut.
 - .2 Fire-Rated Doors: Install doors with clearances according to NFPA 80. *Provide* maximum 6 mm (1/4") at door bottom and not more than 3 mm (1/8") at sides and top.

- .3 Glazing: Comply with installation requirements in Section 08 80 00 and with hollow metal manufacturer's written instructions.
 - .1 Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 230 mm (9") o.c. and not more than 50 mm (2") o.c. from each corner.

3.6 FINISH HARDWARE

- .1 *Install* hardware to doors and frames in accordance with manufacturer's packaged installation, template, and adjusting instructions.
- .2 Preparation:
 - .1 Steel Doors and Frames: Comply with DHI A115 Series.
 - .2 Surface-Applied Door Hardware: Drill and tap doors and frames according to ANSI A250.6.
 - .3 Wood Doors: Comply with DHI A115-W Series.
- .3 Adjust hardware to *Provide* smooth operation of doors and ensure clearances are maintained. *Provide* lubricants to allow smooth function of hardware consistent with manufacturer's recommendations.
- .4 Tighten fastening components snugly. Do not burr or otherwise mar the edges of surfaces of hardware components. Repair defects resulting from work of this Section in accordance with *Consultant's* review.
- .5 Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - .1 Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - .2 Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- .6 Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant to prevent water and air intrusion beneath the sill and to comply with requirements specified in Section 07 92 00.
- .7 Mounting Heights:
 - .1 Mount door hardware units at heights indicated as follows unless otherwise indicated on Drawings or required to comply with governing regulations and requirements of authorities having jurisdictions.
 - .1 Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

3.7 FIELD QUALITY CONTROL

- .1 Non-Conforming Work: Replace damaged work and/or non-conforming work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of *Consultant* at no cost to *Owner*.
- .2 Hardware:
 - .1 Verify hardware listed in Schedule is of proper selection for its apparent function and required fire rating or submit alternative proposals.
 - .2 Ensure hardware for fire-rated openings complies with requirements of authorities having jurisdiction, with door and frame manufacturer's tested and labeled assemblies and that hardware items bear certification labels.
 - .3 Ensure hardware for fire rated door and frame assemblies conforms to CAN/ULC S104-M, CAN/ULC S105-M and NFPA 80. Ensure electronic hardware such as magnetic locks, power supplies, key switches and alarm panic bolts is ULC labeled.
 - .4 Ensure hardware for doors in fire separations and exit doors are certified by a Canadian Certification Organization accredited by Standards Council of Canada.
 - .5 Ensure mortise locks, exit devices and door closers conform to both BMHA certified ANSI A156 Series Grade I classifications, conform to OBC, CAN/CSA B651, requirements and to ADA (American Disabilities Act) standards.
 - .6 Inspect to verify hardware has been properly installed and is functioning satisfactorily.
 - .7 Recommend adjustments.
 - .8 Replace defective hardware.
 - .9 Check door closers after installation to ensure adjustment such as backchecking degree has been properly made and if not, make such adjustments or instruct those installing hardware to make these adjustments.
- .3 Installation Tolerances (Hollow Metal Frames): Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - .1 Squareness: +/- 1.6 mm (1/16"), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - .2 Alignment: +/- 1.6 mm (1/16"), measured at jambs on a horizontal line parallel to plane of wall.
 - .3 Twist: +/- 1.6 mm (1/16"), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - .4 Plumbness: +/- 1.6 mm (1/16"), measured at jambs at floor.

3.8 ADJUSTING AND CLEANING

- .1 Check and readjust operating hardware items immediately before final inspection, leaving doors and frames undamaged and in proper operating condition. Remove and replace defective work, including doors and frames that are warped, bowed, or otherwise unacceptable.
- .2 Hardware:

- .1 Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
- .3 Clean grout and other bonding material off detention doors and frames immediately after installation. Carefully wipe clean doors of dust created due to work of this Project.
- .4 Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.
- .5 Touch-ups:
 - .1 Immediately after erection clean and repair surfaces in accordance with manufacturer's written instructions
 - .2 Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
 - .3 Touch up damaged finishes with compatible coating after sanding smooth.

3.9 DEMONSTRATION

- .1 Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: Provide labour, materials, products, equipment and services to complete the joint sealants work specified herein. This includes, but is not necessarily limited, to:
 - .1 Interior joint sealants,
 - .2 Auxiliary materials required for a complete installation.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Division 01.

1.5 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for Project in accordance with requirements of Division 01.
 - .1 Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving, and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
- .3 Warranties: Submit sample of extended warranties specified herein.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.

- .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.
- .2 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

1.7 PROJECT CONDITIONS

- .1 Do not proceed with installation of joint sealants under the following conditions:
 - .1 When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 5 deg C (40 deg F).
 - .2 When joint substrates are wet.
 - .3 Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated on Drawings and Schedules.
 - .4 Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- .1 Products of following manufacturers may be acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
 - .1 GE Silicones (Momentive Performance Materials)
 - .2 Master Builders Solutions Canada Inc. (Formerly BASF Canada Inc.);
 - .3 Master Builders Solutions Canada Inc;
 - .4 Pecora Corporation;
 - .5 Sika Canada Inc.;
 - .6 Tremco Incorporated.
- .2 Comparable Products from manufacturers listed herein offering functionally and aesthetically equivalent products in Consultant's opinion, and subject to Consultant's review, will be considered provided they meet the requirements of this Specification.

2.2 DESCRIPTION

- .1 Design and Performance Requirements
 - .1 Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
 - .2 Liquid-Applied Joint Sealants: Comply with ASTM C920 and other requirements indicated on Drawings and Schedules for each liquid-applied joint sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - .3 Suitability for Contact with Food: Where sealants are indicated on Drawings and Schedules for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

- .4 Colours of Exposed Joint Sealants: As selected by Consultant from manufacturer's full range.

2.3 INTERIOR JOINT SEALANTS

- .1 Single component, nonsag, neutral curing silicone or urethane sealant, ASTM C920, Type S or Type M, Grade NS, Class 50, Class 35 or Class 25 as required for applications and joint design, for Use NT.
- .1 Interior joints in vertical surfaces and horizontal nontraffic surfaces as follows:
- .1 Tile control and expansion joints.
- .2 Vertical joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
- .3 Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
- .4 Other joints as indicated on Drawings and Schedules.
- .2 Acceptable Products:
- .1 "Dowsil 791" or "Dowsil 795" or "Dowsil CWS" by Dow Chemical of Canada ULC
- .2 "Spectrem 2" or "Spectrem 3" or "Dymonic" or "Dymonic FC" by Tremco Incorporated
- .3 "SilPruf LM SCS2700" by GE Silicones (Momentive Performance Materials)
- .4 "890NST" or "890FTS" or "864NST" or "PCS" or "DnyaTrol I-XL" or "DynaTrol II" by Pecora Corporation
- .5 "SikaSil WS-295" by Sika Canada Inc.
- .6 Approved equivalent.
- .2 Mildew-Resistant, Single-Component, Nonsag, Silicone Joint Sealant, ASTM C920, Type S, Grade NS, Class 25, for Use NT
- .1 Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces as follows:
- .1 Joints between plumbing fixtures and adjoining walls, floors, and counters.
- .2 Tile control and expansion joints.
- .3 Other joints as indicated on Drawings and Schedules.
- .2 Acceptable Products: Mildew-Resistant, Single-Component, Acid-Curing or Neutral Curing Silicone Joint Sealant, ASTM C920, Type S, Grade NS, Class 25, for Use NT.
- .1 "Dowsil 786 Mildew Resistant" or "Dowsil Tub/Ceramic/Tile" by Dow Corning Corporation
- .2 "Silicones; Sanitary SCS1700" by GE Silicones (Momentive Performance Materials)
- .3 "Tremsil 200 Sanitary" by Tremco Incorporated
- .4 "Sikasil GP/GP HT" by Sika Canada Inc.
- .5 "898 NST" by Pecora Corporation
- .3 Nonsag, paintable, nonstaining latex complying with ASTM C834 or butyl rubber sealant complying with ASTM C1311.

- .1 Surface Burning Characteristics: Flame spread, and smoke developed indexes not greater than 25 and 450, respectively.
- .2 Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces as follows:
 - .1 Acoustical joints at top and bottom of gypsum board partitions; at top of masonry walls and through non fire-rated penetrations in gypsum and masonry walls.
 - .2 Other joints as indicated on Drawings and Schedules.
- .3 Acceptable Products:
 - .1 "AC-20 FTR" or "AIS-919" by Pecora Corporation
 - .2 "SHEETROCK Acoustical Sealant" by CGC Inc.
 - .3 "QuietZone Acoustic Sealant" by Owens-Corning Canada Inc.
 - .4 "Tremco Acoustical Sealant" by Tremco Ltd.
 - .5 "QuietSeal" or "QuietSeal 350" by Serious Materials.
 - .6 "CP506 – Smoke and Acoustic Sealant" by Hilti
 - .7 "RCS20" by GE Silicones (Momentive Performance Materials)
 - .8 "MasterSeal NP520" by Master Builders Solutions

2.4 JOINT SEALANT BACKING

- .1 Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated on Drawings and Schedules by sealant manufacturer based on field experience and laboratory testing.
- .2 Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin) or Type B (bicellular material with a surface skin) or Type O (open-cell) as approved in writing by joint-sealant manufacturer for joint application indicated on Drawings and Schedules, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- .3 Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

- .1 Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated on Drawings and Schedules, as determined from preconstruction joint-sealant-substrate tests and field tests.
- .2 Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- .3 Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Site Verification of Conditions:
 - .1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
 - .2 Examine joints indicated on Drawings and Schedules to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
 - .3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- .1 Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - .1 Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - .2 Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
 - .3 Remove laitance and form-release agents from concrete.
 - .4 Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- .2 Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated on Drawings and Schedules by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- .3 Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- .1 General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated on Drawings and Schedules, unless more stringent requirements apply or are indicated.
- .2 Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated on Drawings and Schedules.
- .3 Install sealant backings as recommended by joint sealant manufacturer to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

- .1 Do not leave gaps between ends of sealant backings.
- .2 Do not stretch, twist, puncture, or tear sealant backings.
- .3 Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- .4 Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints to prevent three-sided adhesion.
- .5 Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - .1 Place sealants so they directly contact and fully wet joint substrates.
 - .2 Completely fill recesses in each joint configuration.
 - .3 Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- .6 Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated on Drawings and Schedules; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - .1 Remove excess sealant from surfaces adjacent to joints.
 - .2 Use tooling agents that are approved in writing by sealant manufacturer and that do not discolour sealants or adjacent surfaces.
 - .3 Provide concave joint profile per Figure 8A in ASTM C1193, unless otherwise indicated on Drawings and Schedules.
 - .4 Provide flush joint profile where indicated on Drawings and Schedules per Figure 8B in ASTM C1193.
 - .5 Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C1193.
 - .1 Use masking tape to protect surfaces adjacent to recessed tooled joints.
- .7 Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated on Drawings and Schedules, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written recommendations.

3.4 CLEANING

- .1 Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- .1 Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Performance of the Work. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* hollow metal doors and frames including but not limited to following:
 - .1 Interior hollow metal doors
 - .2 hollow metal door frames.
 - .3 frame anchors
 - .4 preparation of hollow metal doors and frames for CSA approved wiring system and conduits for electronic hardware.
 - .5 Auxiliary materials required for a complete installation.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Definitions:
 - .1 Minimum base steel thicknesses for gauges: in accordance with Appendix 1 of CSDMA "Recommended Specifications for Commercial Steel Door and Frame Products". Steel sheet thicknesses specified herein are base metal thicknesses prior to galvanizing.
 - .2 Performance Levels and Duty-rating: Conform to NAMM/HMMA 805 as modified in this Section:
 - .1 Heavy Duty Assemblies:
 - .1 Door Frame: Minimum 1.98 mm (14 ga - 0.077 inch);
 - .2 Door Face: Minimum 1.98 mm (14 ga - 0.077 inch);
- .2 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at *Project* site to review *Project* requirements and site conditions with pertinent parties. Conform to requirements of Division 01.
 - .2 Coordination
 - .1 Coordinate anchorage installation for Pressed Steel Frames. Supply setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for *Project* in accordance with requirements of Division 01. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
- .3 *Shop Drawings*: Submit *Shop Drawings* or catalogue sheets fully illustrating work of this Section in accordance with Division 01.
 - .1 Ensure Shop Drawings or manufacturer's catalogue sheets contain detailed description, and bear item numbers, marked to show quantity, colour, model numbers, fabrication details and installation instructions. Ensure Shop Drawings show following:
 - .1 detailed elevations of all doors and frames,
 - .2 jamb and head details for all frame types,
 - .3 meeting and style details on pairs of doors,
 - .4 materials used,
 - .5 core thicknesses,
 - .6 mortises, reinforcements,
 - .7 location of exposed fasteners,
 - .8 openings,
 - .9 arrangement and installation requirements of hardware and reinforcements,
 - .10 fire ratings,
 - .11 methods of anchorage.
 - .2 For each door and frame scheduled for electrical hardware, show following items in addition to minimum requirements (Coordinate with division 26):

- .1 location and size of junction boxes and conduit for electrical hardware and wiring.
- .2 conduit cut-outs,
- .3 other information related to electrical hardware or interrelated systems such as fire alarm and security systems/controls.
- .3 Schedules: Submit a schedule indicating each door and frame related to Door Schedule. Identify each unit with door marks and numbers relating to numbering on Drawings and in Door Schedules.
- .4 Field Measurements: Take field measurements prior to preparation of Shop Drawings and fabrication to ensure proper fitting of work. Do not fabricate work until Shop Drawings and hardware schedules have been reviewed.
- .4 Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.
- .5 Test and Evaluation Reports:
 - .1 Submit following test reports:
 - .1 Reports substantiating that steel door and frame assemblies supplied under this Section meet acceptance criteria of ANSI A224.1 and ANSI A250.4, Level "A".
 - .2 Ensure reports include name of testing authority, date of test, location of test facility, descriptions of test specimens, procedures used in testing and compliance with acceptance criteria of test.
 - .3 If requested by Consultant or authorities having jurisdiction, Submit in addition to fire label, certificates substantiating design and construction of fire-rated screen assemblies.

1.6 QUALITY ASSURANCE

- .1 Manufacturer Qualifications:
 - .1 Execute work of this Section by a manufacturer who is a member of CSDMA.
 - .2 Ensure Products supplied are manufactured by a firm experienced in design, production of standard, custom commercial steel door and frame assemblies; integration of builders' or electronic hardware, glazing assemblies and other items affecting work.
 - .3 Upon request, submit manufacturer's evidence of minimum 5 years continuous experience in type of work specified under this Section for Projects of similar size and scope.
 - .4 Ensure manufacturer has personnel and plant equipment capable of fabricating steel door and frame Products of types specified with written quality control and system in place.
- .2 Supplier Qualifications: Ensure Product Supplier has Architectural Hardware Consultant (AHC) or person of equivalent experience, available at reasonable times to consult with Consultant, Contractor and Owner.

- .3 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.
- .4 Installer Qualifications:
 - .1 Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of Product manufacturers.
 - .2 Ensure retained installers are familiar with Product manufacturers specified herein and with ANSI/NFPA 80 requirements for installation of labeled fire rated steel doors, frames and hardware.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
 - .1 Be responsible for supply of Products specified herein to site in timely manner, so as not to delay progress of other trades.
 - .2 Protect doors and frames during shipping and storage.
 - .3 Inspect materials thoroughly upon receipt and report discrepancies, deficiencies and damages immediately in writing to Consultant. Note damages on carrier's Bill of Lading.
 - .4 Notify Supplier in writing of errors or deficiencies inherent to materials prior to initiating corrective work.
- .2 Storage and Handling Requirements:
 - .1 Provide site storage and protection of materials in accordance with NAAMM-HMMA 840 and coordinate requirements with Section 06 90 00 for installation of doors.
 - .2 Immediately Make Good any damage acquired during shipping or handling. Clean scratches and touch up with rust-inhibitive primer. Replace damaged work which cannot be repaired, restored or cleaned.
 - .3 Store items in dry, secure location on planks or dunnage. Store Door and frame Products in vertical position, spaced with blocking. Cover materials to protect them from damage but in such a manner as to permit air circulation.

1.8 WARRANTY

- .1 Warrant Work of this Section for period of 10 years from Substantial Performance of the Work against defects and deficiencies in accordance with General Conditions of the Contract. Promptly correct defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to: buckling, opening of seams, defective welding and extensive colour fading.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- .1 *Products* of following manufacturers may be acceptable subject to conformance to requirements of *Drawings*, *Schedules* and *Specifications*:
 - .1 Artek Door Limited; www.artekdoor.com
 - .2 Baron Metal; www.baronmetal.com
 - .3 Daybar Industries Limited; www.daybar.com
 - .4 Fleming Door *Products* Limited; www.flemingdoor.com
 - .5 Gensteel Doors; www.gensteeldoors.com
- .2 Substitution Limitations: This Specification is based on Fleming's *Products*. Comparable *Products* from manufacturers listed herein offering functionally, aesthetically equivalent products in *Consultant's* opinion and subject to *Consultant's* review will be considered provided they meet the requirements of this *Specification*.

2.2 DESCRIPTION

- .1 Design and Performance Requirements:
 - .1 Unless otherwise indicated, construct doors to be minimum 44.5 mm (1-3/4 inches) thick.
 - .2 Construct doors to meet requirements of NAAMM-HMMA 861 and CSDMA specifications. Ensure door and frame *Products* are fabricated in strict accordance with reviewed Shop Drawings. Ensure steel is free of scale, pitting, coil breaks, surface blemishes, buckles, waves and other defects.
 - .3 Facilitate installation of electrical components complete with arrangement so conduits and wiring can be readily removed and replaced.

2.3 MATERIALS

- .1 Metallic-Coated Steel Sheet: ASTM A653/A 653M, Commercial Steel (CS), Type B.
 - .1 Interior doors and frames in high moisture locations (showers, and similar locations): Comply with A 653/A 653M, Designation ZF 180 (A60).
 - .2 Interior doors and frames unless indicated otherwise: Comply with A 653/A 653M, Designation ZF 120 (A40)
- .2 Frame Anchors: ASTM A879/A 879M, Commercial Steel (CS), 12G (04Z) coating designation; mill phosphatized.
- .3 Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A 153M.
- .4 Grout: ASTM C476, except with a maximum slump of 102 mm (4 inches), as measured according to ASTM C143/C 143M.

- .5 Mineral-Fiber Insulation: CAN/ULC S702 or equivalent to ASTM C665 (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing CAN/ULC-S114 or equivalent to ASTM E136 for combustion characteristics.
- .6 Bituminous Coating: Cold-applied asphalt mastic, compounded for 0.4-mm (15-mil) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.4 PRODUCT TYPES

- .1 Construct interior doors and frames to comply with the standards indicated in this Section for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- .2 Interior Medium-Duty Doors and Frames:
 - .1 Physical Performance: Level B according to SDI A250.4.
 - .2 Doors:
 - .1 Materials: Cold-rolled steel sheet, minimum 1.98 mm (14 ga - 0.077 inch); galvanized as specified herein.
 - .2 Edge Construction: Full Flush; Mechanically interlocked, adhesive assisted and tack welded at top and bottom of door, 150 mm (6") on centre and above and below each edge cutout, filled with metal filler and ground smooth with no visible seams
 - .3 Core: Polystyrene.
 - .4 Basis-of-Design: "CW-Series" by Fleming or approved equivalent.
 - .3 Frames:
 - .1 Materials: Cold-rolled steel sheet, minimum 1.98 mm (14 ga - 0.077 inch); galvanized as specified herein.
 - .2 Construction: Face welded unless indicated otherwise.
 - .3 Basis-of-Design:
 - .1 "F Series" by Fleming or approved equivalent for frames occurring in masonry construction.
 - .2 "DW Series" by Fleming or approved equivalent for frames occurring in gypsum board construction.
 - .3 "A-Series" by Fleming or approved equivalent for frames occurring in existing partitions.
 - .4 Exposed Finish: Factory-primed for site finishing.

2.5 FABRICATION

- .1 Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
 - .1 Provide factory-preparation and reinforcements for doors and frames including mortising, blanking, drilling and tapping for templated hardware only, in accordance with the reviewed hardware schedule and templates provided by hardware supplier.
 - .2 Reinforce doors and frames in factory only where required, for surface-mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware. Perform drilling and tapping on site, at time of installation.
 - .3 Prior to shipment, mark each door and frame with identification number as shown on approved Shop Drawings.
- .2 Hollow-Metal Doors:
 - .1 Holes 12.7 mm (0.5") diameter and larger must be factory-prepared, except mounting and through-bolt holes, which are made on site, at time of hardware installation. Holes less than 12.7 mm (0.5") diameter will be factory-prepared only when required for device (for knob, lever, cylinder, thumb or turn pieces) or when holes overlap function holes.
 - .2 Vertical Edges for Single-Acting Doors: Bevel edges 3 mm in 50 mm (1/8 inch in 2 inches) unless otherwise required to suit finish hardware or door swings.
 - .3 Top Edge Closures:
 - .1 Interior locations: Sealed, flush steel closures, continuously welded.
 - .2 Interior locations (security locations): Non-sealed, flush steel closures.
 - .4 Bottom Edge Closures: Close bottom edges of door with end closures or channels of same material as face sheets.
 - .1 Interior locations: Sealed, flush steel closures, continuously welded.
 - .2 Interior locations (security locations): Non-sealed, flush steel closures.
 - .5 Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated on Drawings and Schedules. Extend minimum 19 mm (3/4 inch) beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
- .3 Pressed Steel Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - .1 Protect mortised cutouts in frames with steel guard boxes.
 - .2 Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - .3 Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

- .4 Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
- .5 Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
- .6 Terminated Stops: Terminate stops 152 mm (6 inches) above finish floor with a 45 degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.
- .7 Jamb Anchors: Provide anchorage appropriate to floor, wall and frame construction. Locate each anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite strike jamb.
 - .1 Provide number and spacing of anchors as follows:
 - .1 Two anchors per jamb up to 1520 mm (60 inches) high.
 - .2 Provide additional anchor for each additional 760 mm (30 inches) of height or fraction thereof up to 3050 mm (120 inches) high.
 - .3 Provide four anchors per jamb plus one additional anchor per jamb for each 610 mm (24 inches) or fraction thereof above 3050 mm (120 inches) high.
 - .2 Frames in previously placed concrete, masonry or structural steel: Locate anchors not more than 150 mm (6 inches) from the top and bottom of each jamb, and intermediate anchors at 660 mm (26 inches) o.c. maximum.
 - .3 Frames in stud-Wall Type: Locate anchors not more than 457 mm (18 inches) from top and bottom of frame, and intermediate anchors at 813 mm (32 inches) o.c. maximum.
 - .4 Where frame product is installed prior to adjacent partition, securely attach floor anchor to the inside of each jamb profile.
 - .1 Provide each floor anchor with two (2) holes for securing to floor. For conditions that do not permit the use of floor anchors, provide additional wall anchor, located within 150 mm (6 inches) of base of jamb.
- .8 Door Silencers: Except on weather-stripped and gasketed frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - .1 Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - .2 Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- .9 Welded Type Frames (interior locations as noted herein):
 - .1 Frame products must be accurately mitered or mechanically jointed.
 - .2 Full Profile welded: punch-mitered - continuously welded on profile faces, rabbets, returns and soffit intersections, or saw-mitered - continuously welded on the profile faces, rabbets, returns, stops and soffit intersections.
 - .1 Punch or saw-mitered, at the manufacturer's discretion.
 - .2 All profile welded frame product exposed faces must be filled and ground to a smooth, uniform, seamless surface.
 - .3 Face welded: continuously welded on the profile faces, with exposed faces filled and ground to a smooth, uniform, seamless surface.
 - .4 Joints at mullions, sills and center rails:
 - .1 Must be coped accurately, butted and tightly fitted.

- .2 At intersecting flush profile faces, be securely welded, filled and ground to a smooth, uniform, seamless surface.
- .3 At intersecting recessed profile faces, be securely welded to concealed reinforcements, with exposed hairline face seams.
- .4 At all other intersecting profile elements, have exposed hairline face seams.
- .5 Glazing stops must be formed steel channels, minimum 16 mm (0.625 inch) height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .10 Knocked Down Type Frames (interior locations as noted herein):
 - .1 Ship knocked-down type frames unassembled.
 - .2 Provide frames with mechanical joints which inter-lock securely and provide functionally satisfactory performance when assembled and installed in accordance with the manufacturer's instructions.
- .4 Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, CSDMA Specifications, Door Hardware Schedule, and templates. Refer to Section 08 71 00 for additional requirements:
 - .1 Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - .2 Comply with applicable requirements in BHMA A156.115 and CSDMA Specifications for preparation of hollow-metal work for hardware.
 - .1 Lock and Strike Reinforcements: 2.36 mm (12 ga - 0.093 inch) – high frequency types
 - .2 Hinge Reinforcements: 3.12 mm (10 ga - 0.123 inch) – high frequency types
 - .3 Flush Bolt Reinforcements: 2.36 mm (12 ga - 0.093 inch) – high frequency types
 - .4 Reinforcements for Surface Applied Hardware: 1.34 mm (16 ga - 0.053 inch)
 - .5 Top and Bottom Channels: 1.06 mm (18 ga - 0.042 inch)
 - .6 Steel Top Caps: 0.81 mm (20 ga - 0.032 inch)
 - .7 Glass Trim (Screw Fixed or Snap-In Types): 0.81 mm (20 ga - 0.032 inch) Mortar Guard Boxes: 0.66 mm (22 ga - 0.026 inch)
 - .8 Floor Anchors: 1.34 mm (16 ga - 0.053 inch)
 - .9 Wall Anchors:
 - .1 Masonry Strap Type: 1.06 mm (18 ga - 0.042 inch)
 - .2 Masonry Wire Type: 4.0 mm (0.156 inch) dia.
 - .3 Masonry Stirrup-Strap Type: 1.34 mm (16 ga - 0.053 inch)
 - .4 Stud Type: Designed to engage stud, welded to back of frames; not less than 1.0 mm (18 ga - 0.042 inch) thick.
 - .5 Existing Masonry /Concrete Wall Type: not less than 1.0 mm (18 ga - 0.042 inch) thick.
 - .3 Where electrified hardware is specified on Hardware Schedule, Provide CSA-approved system consisting of CSA-approved conduit, junction boxes and wire harnesses complete with modular plugs for coordinated connection directly to electrified hardware.

2.6 STEEL FINISHES

- .1 Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - .1 Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
 - .2 Remove weld slag and spatter from exposed surfaces.
 - .3 Fill and sand tool marks, abrasions and surface imperfections to present smooth and uniform surfaces.
 - .4 On exposed surfaces where zinc has been removed during fabrication, *Provide* factory applied touch-up primer. Ensure primer is fully cured prior to shipment.

2.7 SOURCE QUALITY CONTROL

- .1 Sizes and Tolerances: In accordance CSDMA - "Recommended Dimensional Standards for Commercial Steel Doors and Frames".
- .2 Hardware Locations
 - .1 Location of hardware on doors and frames *Products* to be per manufacturer's published standards.
 - .2 Ensure hardware preparation tolerances comply with ANSI A115 series standards.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 *Supply* steel doors and frames to Section 06 90 00 for installation.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* rolling counter shutter including but not limited to following:
 - .1 rolling counter shutter.
 - .2 Auxiliary materials required for a complete assembly.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Sequencing: Coordinate installation with related Sections referenced herein.
- .2 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Division 01.
 - .2 Pre-construction Site Meeting:
 - .1 Prior to start of work, arrange for Project site meeting of parties associated with work of this Section, including non-exhaustively Subcontractor performing work of trade involved, testing company's representative and Contractor's consultants of applicable discipline. Consultant may attend.
- .3 Scheduling:
 - .1 Prior to commencing work of this Section arrange for manufacturer's technical representative to review with Contractor and Consultant, procedures to be adopted and conditions under which work shall be performed. Inspect surfaces to determine adequacy of existing and proposed conditions.

1.5 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for *Project* in accordance with requirements of Division 01. Ensure data sheets provide required information including detailed instructions for installing as well as

maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.

- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
- .3 *Shop Drawings*: Submit *Shop Drawings* for work of this Section in accordance with Division 01. In addition to the minimum requirements indicate following:
 - .1 face wall or between jamb placement.
 - .2 tolerances and clearances.
 - .3 finishes.
 - .4 hardware.
 - .5 operating mechanism.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
 - .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.
- .2 Licensed Professionals: Employ a full time professional structural engineer registered in the province of Ontario, carrying minimum \$2,000,000.00 professional liability insurance to:
 - .1 design the components of the work of this Section requiring structural performance,
 - .2 be responsible for full assemblies and connections
 - .3 be responsible for determining sizes, yield strengths, gauge thicknesses and joint spacing to allow thermal movement and loading of components in accordance with applicable codes and regulations,
 - .4 be responsible for production and review of *Shop Drawings*,
 - .5 inspect the work of this Section during fabrication and erection,
 - .6 stamp and sign each shop drawing,
 - .7 *Provide* site administration and inspection of this part of the *Work*.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- .1 Products of following manufacturers may be acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
 - .1 Atlas Overhead Door Co. Ltd.; www.atlasdoors.ca
 - .2 The Cookson Company; www.cooksondoor.com
 - .3 Cornel Iron Works, Inc.; www.cornelliron.com
 - .4 Wayne Dalton; www.wayne-dalton.com

- .5 Overhead Door Corporation; www.overheaddoors.com
- .2 Substitution Limitations: This Specification is based on "Rolling Aluminum Shutter ASH208 " by Amstel Manufacturing. Comparable Products from manufacturers listed herein offering functionally and aesthetically equivalent products in Consultant's opinion, and subject to Consultant's review, will be considered provided they meet the requirements of this Specification.

2.2 MATERIALS

- .1 Aluminum Extrusions: ASTM B221M size accurately formed as shown on the Drawings, extruded aluminum alloy AA-6063- T5 or T6 for aluminum. Ensure surfaces are free from defects impairing appearance, strength and durability.
- .2 Aluminum Sheet: ASTM B209M, minimum thickness 3 mm (1/8") of type and characteristics to match finished extrusions; sheet which is not exposed shall be Utility Aluminum mill finished; for intricate forming with decorative finishes use AA 1100 and for siding and exposed panels use AA-3003 with specified finish.
- .3 Structural Supports: Provide suspended structural steel framing from structural members designed to support the rolling grille. Provide lateral bracing for rigidity. Provide lateral bracing for rigidity. Coordinate with the Work of Section 05 50 00, Metal Fabrications.
- .4 Welding Materials: Conforming to CSA W48.1-M and CSA W59-M.
- .5 Curtain: Interlocking extruded aluminum slat sections (0.050") thick, (3/8") deep and individually (1-1/2") high, with an overall width sized to suit door opening.
- .6 Bottom Bar: Horizontal bottom bars of tubular aluminum extrusion 32 mm (1.25") width and 50 mm (2") in height. Provide bottom bar with master-keyed cylinder camlock on both sides.
- .7 Aluminum Guides:
 - .1 32 mm (1.25") wide by 44.5 mm (1.75") deep extruded aluminum guide sections with built-in upset shoulders to Provide curtain retention.
 - .2 Ensure guides are provided with tamper-resistant fasteners as required to meet design requirements.
 - .3 Each guide to be fabricated with a bell mouth to Provide smooth curtain operation.
 - .4 Mount steel stoppers to guides to prevent roll over and travel above finished bulkhead/soffit.
 - .5 Guides to be fitted with wool pile wear strip on the outside and rigid PVC stripping on interior face to ensure smooth and quiet operation and reduce wear.
 - .6 Fasten guides to masonry or structural supports with concealed fasteners at maximum 610 mm (2'-0") O.C.
- .8 Locking Hardware: Provide slide bolt locking hardware. Provide master keyable cylinder locking hardware complete, with cylinder.
- .9 Counterbalance: Construct of extruded aluminum involute tube to act as pipe barrel.
- .10 Bracket Plates:
 - .1 Galvanized Steel: Minimum 3 mm (1/8") Z275 galvanized steel, commercial quality in accordance with ASTM A653M.

2.3 FINISHES

- .1 Aluminum Finish: Architectural Class II; Clear anodized in accordance with Aluminum Association Finish Designation AA-M12-C22-A31.

- .2 Primer for Concealed Steel Components: Manufacturer's standard factory-applied primer complying with the requirements of CAN/CGSB 1.105 and CAN/CGSB 1.213 compatible with the finish system.
- .3 Paint Finish: Provided as part of the Work of Section 09 91 00, Painting.
- .4 Isolation Coating: Cold-applied asphalt mastic complying with SSPC-Paint 12, but containing no asbestos fibers OR bituminous paint, alkali-resistant bituminous paint or epoxy resin solution to Provide dielectric separation between dissimilar metals. Ensure materials will dry to be tack-free and withstand high temperatures.

2.4 FABRICATION

- .1 Fabricate each end of alternate slats with endlocks to act as a wearing surface and to maintain slat alignment.
- .2 Equip bottom bar with vinyl astragal.
- .3 Fabricate guides with curtain retainer and wear strip for contact with slats.
- .4 Aluminum Hood: Fabricate of 0.040" clear anodized aluminum sheet, press-bent to form suitable coil enclosure to suit design requirements.
- .5 Provide counterbalance assembly consisting of helical torsion spring with 25% overload factor. Enclose spring in steel pipe to support door curtain and counterbalance mechanism with maximum deflection of 1/360th of opening width. Provide spring tension adjusting wheel, accessible for setting. Springs shall be grease packed and shall be mounted on a steel inner shaft rod. Provide ball bearings to minimize wear of pipe shaft rotation around inner shaft.
- .6 Support counterbalance assembly on steel plate brackets, forming end enclosures.
- .7 Enclose counterbalance assembly with rectangular hood.

2.1 MANUAL DOOR OPERATION

- .1 Provide manual push-up or hoist operation. Confirm handle selection with Consultant prior to fabrication.
- .2 Locking: Manufacturer's standard mortise cylinder locking at center of bottom bar on coil side.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Site Verification of Conditions: Verify through direct observation and field measurements that Site conditions are acceptable for installation of doors and accessories. Ensure that openings are square flush and plumb.
- .2 Do not proceed with installation of doors, operators, controls and accessories until unacceptable conditions are corrected.

3.2 PREPARATION

- .1 Conform Site preparations to detailed contained in approved Shop Drawings.
- .2 Make structural or other preparation of opening to receive guides and grille, Provide finish or trim to opening.

3.3 INSTALLATION

- .1 Provide shutters in accordance with the manufacturers' printed instructions.
- .2 Provide shutters mounted to the face of the wall or between jambs as indicated in the approved shop Drawings.

3.4 ADJUSTING

- .1 Adjust operable parts for correct function.
- .2 Remove temporary coverings and protection of adjacent work areas. Repair or replace installed Products damaged prior to or during installation.
- .3 Clean installed Products in accordance with the manufacturer's instructions prior to the Minister's Representatives acceptance.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included:
 - .1 Furnish, deliver and install finish hardware.
 - .2 It is intended that the following list of hardware will cover finish hardware to complete the project. Bring to the Consultants attention any omissions, discrepancies that will affect work in this section during the bidding period.

1.3 PRODUCTS SUPPLIED BUT NOT INSTALLED IN THIS SECTION

- .1 Power supplies, compressor/control boxes, junction boxes installed by Division 26.

1.4 REFERENCES

- .1 Door and Hardware Institute - Recommended locations for Architectural Hardware for Standard Steel Doors and Frames
- .2 Door and Hardware Institute - Recommended locations for Architectural Hardware for Flush Wood Doors
- .3 CSDMA-Recommended Dimension Standards for Commercial Steel Doors and Frames (Hardware Locations)
- .4 NFPA 80-Standard for Fire Doors and Windows, 1999 Edition
- .5 Door and Hardware Institute - Sequence Format for Hardware Schedule
- .6 Door and Hardware Institute - Key Systems and Nomenclature
- .7 Door and Hardware Institute - Abbreviations and Symbols used in Architectural Door and Hardware Schedules and Specifications
- .8 Door and Hardware Institute – Installation Guide for Doors and Hardware
- .9 Ontario Building Code 2021

1.5 SUBMITTALS

- .1 Updated Finish Hardware Schedule:
 - .1 Submit submittals in accordance with Division 01 Submittal Procedures. Prepare detailed hardware schedules in Door and Hardware (DHI) vertical format as detailed in Reference 1.4.4.
- .2 Product Data:
 - .1 Submit in a three-ring binder six (6) copies of product data sheets with the finish hardware schedule showing items of hardware to be used on the project.
- .3 Templates:

- .1 Submit templates within to related trades when requested.
- .4 Keying Schedule:
 - .1 After a keying meeting between representatives of the Owner, furnish a keying schedule listing the levels of keying as well as an explanation of the key system's function, the key symbols used, and the door numbers controlled. Utilize "Door and Hardware Institute - Key Systems and Nomenclature" as a guideline for nomenclature, definitions, and approach for selecting the optimal keying system. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions. Provide one complete biting list of key cuts and one key system schematic illustrating system usage and expansion. Forward biting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
- .5 Wiring Diagrams
 - .1 Co-ordinate with related trades, meet with the owner and security provider and submit a written description of the functional use (mode of operation) of electrical hardware products specified. Include operation for ingress, egress, fire alarm, and after hours use where applicable. Include door and frame elevations showing the location of each item of electrical hardware to be installed, mode of operation including a diagram showing number and size of conductors. Indicate on elevation drawing items provided by related trades, include for back boxes, and 120V power sources. Provide point to point drawings showing terminal connections necessary for a complete installation.
- .6 Operations and Maintenance Data
 - .1 Prior to Substantial Performance of the Work Substantial Performance of the Work, furnish to the owner, two (2) copies of an owner's operation and maintenance manuals in a three-ring binder with the following information:
 - .1 Name of hardware distributor, address and contact name
 - .2 Copy of final "as-built" finish hardware schedule
 - .3 As installed "wiring diagrams, elevations, risers, point to point"
 - .4 Copy of final keying schedule
 - .5 Copy of floor plans with keying nomenclature assigned to door numbers as per the approved keying schedule
 - .6 Catalogue cut sheets and product specifications for each product
 - .7 Parts list for each product
 - .8 Installation instructions and templates for each product.

1.6 QUALITY ASSURANCE

- .1 Review installation procedures with the Contractor's Designated Installers. Hold instruction meetings with installers prior to installation and subsequent review meetings during the installation period. Submit minutes of meetings to the Consultant.
- .2 Substitutions
 - .1 Only approved products specified are accepted. Make substitution requests in accordance with Division 1. Include product data and indicate benefit to the project.
- .3 Supplier Qualifications

.1 Successful hardware distributor to have a minimum of five (5) years' experience in the door and hardware industry. Distributor to have on staff an Architectural Hardware Consultant (A.H.C.) whose name will be listed on the hardware schedule title page submittal and will be responsible for scheduling, detailing, (see Reference 1.5.4) ordering and co-ordination of the finishing hardware for this project. If so, requested by the Consultant and or installer this individual will be required to visit the jobsite for any installation problems that may occur.

.4 Designated Installers

.1 Hardware Installers must have a minimum of five (5) years' experience in installation of hardware. Provide verification of installer's qualification to Consultant for approval. Installers to attend review meetings with the Hardware Distributor.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Marking and Packaging

.1 Mark cartons with heading number, door number, and key-set symbol where applicable in original packaging provided by the manufacturer. Pack packaged hardware in suitable wrappings and containers to protect it from damage during shipping and storage.

.2 Enclose accessories, fastening devices and other loose items with each applicable item of hardware.

.2 Delivery

.1 Deliver hardware to related trades.

.3 Storage

.1 Store in a clean, dry room with lockable man door and adequate shelving to permit organization so item numbers are readily visible.

1.8 WARRANTY

.1 Supply warranties by the accepted manufacturers.

Hardware Item	Length of Warranty
Mortise Hinges	1 year
Locks (Mortise)	3 years
Keypad Locks	1 year
Exit Devices	3 years
Door Closers – Mechanical 1460 series	25 years
Overhead Stops/holders	1 year

1.9 MAINTENANCE

.1 Maintenance Service

.1 After the building is occupied arrange an appointment with the maintenance staff from the arena for instruction of proper use, servicing, adjusting and lubrication of hardware furnished. Submit to the consultant a list of attendees and meeting date.

.2 Extra Materials

.1 Supply the following items in proper manufacturer's cartons once the job has been completed:

.1 5 of each installation tool used for locks/passage/privacy, type of door closers, and exit devices.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- .1 Products listed in the hardware groups are from the manufacturers listed below:

ITEM	MANUFACTURER NAME
Full Mortise Hinges	Ives
Locksets, Latchsets/Deadbolts	Schlage
Cylinders	Schlage
Door Closers	LCN
Overhead Door Holders/Stops	Glynn Johnson

2.2 MATERIALS

- .1 Screws and Fasteners:

- .1 Screws and fasteners to be matching finish to their product and to be manufacturer's standard. Door closers, door holders and exit devices installed on fire rated wood doors and hollow metal doors to be attached with fasteners to meet NFPA 80 requirements.

- .2 Materials-Acceptable Manufacturers

- .1 Mortise Hinges

- .1 Provide five knuckle bearing hinges with NRP option on reverse bevel doors with locking hardware. Hinge width to accommodate door closer projection, door trim and allow for 180-degree swing. Doors up to 2286mm (90") in height, supply 3 hinges, doors greater than 2286mm in height add one hinge for every additional 760mm of door height. Doors 915mm (36") wide and less furnish 114mm (4-1/2") high hinges, doors greater than 915mm (36") wide furnish 127mm (5") high hinges, heavy weight or standard weight as specified. Supply ferrous (steel), stainless steel material for all interior and/or fire-rated doors and stainless steel for exterior doors.

- .2 As Specified: Ives Hinges, 5BB1, 5BB1HW

- .2 Locksets/Deadlocks/Privacy Sets:

- .1 Mortise:

- .1 Grade 1 Operational, Grade 1 Security, mortise lock for commercial and institutional buildings. Manufacture lock cases from fully wrapped, heavy 12 gage steel with a protected leading edge and screw configuration that limits access to operating parts. Lock components to be manufactured of zinc dichromate plated steel. Latch bolts to have a standard 70mm (2 ¾") backset with a full 19mm (¾") throw. Latchbolts to be non-handed, field reversible without opening the lock case. Latchbolts to be 2-piece anti-friction, manufactured from stainless steel. Solid latchbolts and/or plastic anti-friction devices are not acceptable. Deadbolts to be 45mm (1 ¾") total length have standard 25mm (1") throw with a minimum 19mm (¾") internal engagement when fully retracted. Deadbolts to be constructed of stainless steel, incorporating a security roller pin with a minimum Rc60 rating for surface hardness. Lever assembly (external) to be one-piece design attached by threaded bushing. Lever assembly (internal) to be attached by screw less shank. Lever attachments by common tools (allen nuts and/or set screws) are not acceptable. Thru bolt lever assemblies through the door for positive interlock. Levers to have independent rotation in both directions. Lever operation to be freewheeling (clutch) when in the locked mode. Spring cages are to be incorporated into the lever assemblies. Hub blocking plate to be solid, cast stainless steel. Manufacturers utilizing open hub designs are not acceptable. Spindles to be independent, designed to "break away" at a maximum of 75psi torque. Mounting tabs are to be automatic self-adjusting, vertically and horizontally for door bevel and strike alignment. Cylinders to be secured by a cast stainless steel, dual retainer. Manufacturers utilizing screws and/or stamped retainers are not acceptable.
- .2 Supply as Specified: Schlage "L" series
- .3 Door Closers:
 - .1 Medium Duty Mechanical (Interior/Exterior):
 - .1 Non-sized (1-6) and non-handed cylinder body to have 32mm (1 ¼") piston diameter with 16mm (5/8") single heat-treated shaft. Track closer cylinder body non-sized (2-4) or (1-2). Closers to have stamped main arm and forearm. Optional arms to be interchangeable within the series of closers, except track arm type closers. Track arm type closers to have single lever arm with low friction track and roller assembly and provisions for an optional bumper to assist backcheck.
 - .2 Supply as Specified: LCN1460 HD series
- .4 Overhead Door Stops/holders:
 - .1 Heavy Duty Surface Mounted:
 - .1 Surface overhead stops/holders to be stainless steel base, non-handed for single-acting doors with a heavy-duty channel/slide-arm design and offset jamb bracket to allow for simple field modifications of functions. Channel to be surface mounted to the door with thru bolts and the jamb bracket is surface mounted to the frame soffit.
 - .2 Supply as Specified: Glynn-Johnson 90 series
- .5 Door Pulls/Flatware/Coat Hooks:
 - .1 Flatware to be of stainless-steel material, 1mm (.050 gauge).
 - .2 Ives 8200 B-NH-A tape mounting for installation, sizes as specified in hardware groups.

2.3 FINISHES

- .1 Unless otherwise specified, finishes to be brushed chrome (BHMA 626/652). Finishes are specified as follows:

ITEM	BHMA#	DESCRIPTION	BASE MATERIAL
Hinges	652	satin chrome plated	steel
Lock Trim	626	satin chrome plated	brass/bronze
Door Pulls	630	satin stainless steel	stainless steel
Protective Plate	630	satin stainless steel	stainless steel

2.4 [KEYING – STANDARD KEYING WITH EXTERIOR PRIMUS CYLINDERS]

- .1 Cylinders, Keying Systems and Key Control.
- .1 Meet with the Owner to finalize keying requirements and obtain keying instructions in writing as outlined in Division 1.
- .2 Keying requirements to be confirmed by owner.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Ensure that doors and frames are prepared and reinforced to receive finish hardware prior to installation.
- .2 Ensure that door frames and finished floor are plumb and level to permit proper engagement and operation of hardware.
- .3 Verify power is run to door opening requiring electrified hardware.
- .4 Submit in writing a list of deficiencies determined as part of inspection required in 3.1.1 and 3.1.2 to supervising consultant prior to installation of finished hardware. Correct door frame installation before proceeding with finish hardware installation.

3.2 INSTALLATION

- .1 Hardware Installers must have a minimum of five (5) years' experience in installation of hardware.
- .2 Provide verification of installer's qualification to Consultant for approval. Installers to attend review meetings conducted by the hardware distributor.
- .3 Install hardware at mounting heights as specified in the manufacturer's templates or specific references in approved hardware schedule or approved elevation drawings.
- .4 Where mounting height is not otherwise specified, install hardware at mounting heights as indicated in 1.4.1, 1.4.2.
- .5 Install hardware using only manufacturer supplied and approved fasteners in strict adherence with manufacturers published installation instructions.
- .6 Ensure locksets / latchsets / deadlocks are of the correct hand before installation to ensure that the cylinder is in the correct position. Handing is part of installation procedure.
- .7 Ensure that exit devices are of the correct hand and adjust device cam/drive screw for proper outside trim function prior to installation. Handing is part of installation procedure.
- .8 Follow manufactures installation instructions. Adjustment of door closers is inclusive of spring power, closing speed, latching speed and back-check, valve screws to achieve backcheck (4040, 4040XP series) at the time of installation.

- .9 Adjust delayed action door closers to forty (40) second delay for barrier free accessibility and movement of materials. Time period to be approved by Owner.
- .10 Install head seal weatherstrip prior to installation of soffit mounted hardware. Trim cut and notch thresholds and saddles neatly to minimally fit the profile of the door frame. Install thresholds and saddles in a bed of caulking completely sealing the underside from water and air penetration.
- .11 Counter sink through bolt of door pull under push plate during installation.
- .12 Install blocking material in cavities of metal and wood stud walls and partitions. Located concave and convex type door bumpers at the appropriate height to properly contact protruding door trim.
- .13 Verify each door leaf opens closes and latches. Inspect fire rated openings to ensure they are installed in compliance with NFPA 80 requirements. Test access control system and electrified hardware devices for proper operation with owner to sign off on verification of operation. Verify electric door release hardware operates to close the door upon activation of the fire alarm system.
- .14 Perform bi-monthly on-site inspections during hardware installation and provide inspection reports listing progress of work, unacceptable work and corrective measures. Repair or replace as directed by the Consultant.
- .15 Before completion of the work but after the hardware has been installed, submit a certificate to the Consultant stating that final inspection has been made and that hardware has been checked for installation and operation.

3.3 ADJUSTING AND CLEANING

- .1 Check and make final adjustments to each operating item of hardware on each door to ensure proper operation and function.
- .2 Adjust doors with self-closing devices or automatic closing devices for operation after the HVAC system is balanced and adjusted. Adjust spring power of non sized door closers to close and latch the door.
- .3 Hardware to be left clean and free of disfigurements.
- .4 Instruct owner personnel in the operation, adjustment and maintenance of hardware.
- .5 Check locked doors against approved keying schedule.

3.4 PROTECTION

- .1 Protect hardware from damage during construction. Wrap locks, panic hardware, and fire exit hardware, door pull trim with kraft paper or plastic bubble materials to protect finish from damage until date of substantial completion. Remove and reinstall or where necessary, use temporary hardware to maintain finish in new condition and maintain manufacturer's warranty.

3.5 HARDWARE GROUPS

- .1 Refer to hardware group, dated July 30, 2021.

END OF SECTION

Hardware Group No. 101

For use on Door #(s):

CONCESSION
101

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	☰	652	IVE
1	EA	MORTISE CYLINDER	BY OWNER		626	UNK
1	EA	STOREROOM LOCK	L9080P 17B	☰	626	SCH
1	EA	OH STOP	90S	☰	630	GLY
1	EA	SURFACE CLOSER	1461 DEL REG	☰	689	LCN
1	EA	KICK PLATE	8400 205MM X LDW	☰	630	IVE

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* gypsum board work including but not limited to following:
 - .1 framing components (studs, channels, furring etc.)
 - .2 concealed reinforcing
 - .3 interior boards
 - .4 joint treatments
 - .5 trims and accessories
 - .6 auxiliary materials
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Definitions
 - .1 Drywall: Gypsum Board.
 - .2 Steel Thickness:
 - .1 Base Steel Thickness: Thickness of bare steel exclusive of coatings.
 - .2 Design Thickness: Target or "nominal" thickness used to determine structural properties of the cold formed Products.
 - .3 Minimum Thickness: Design thickness minus minimum allowable under-tolerance required by CSA S136 (95% of design thickness) or material specification; whichever is more stringent.
- .2 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Division 01.

- .2 Coordination:
 - .1 Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 - .2 Coordinate installation and cooperate with mechanical and electrical trades to accommodate mechanical electrical items and any other work required to be incorporated into or coordinated with ceiling and soffit systems.
 - .3 Coordinate work of this Section with application of firestopping and fireproofing Work to ensure assemblies provided meet requirements of authorities having jurisdiction.

1.5 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for *Project* in accordance with requirements of Division 01. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
- .3 Shop Drawings: Submit Shop Drawings indicating material characteristics, details of construction, in particular locations of construction joints, connections and relationship with adjacent construction. Take field measurements prior to preparation of Shop Drawings and fabrication to ensure proper fitting of work. Ensure Shop Drawings show following:
 - .1 standard construction of assemblies,
 - .2 sound attenuating construction,
 - .3 locations of access panels,
 - .4 elevations,
 - .5 finishes and relevant details of furring,
 - .6 enclosures and partitions which require fire rating.
- .4 Certificates:
 - .1 Obtain approval of electrical utility authorities having jurisdiction for support of light fixtures, by ceiling grid and supports, to satisfy requirements of electrical inspection department of Local Hydro Company. Adjust grid, fixing devices and support hangers as required to obtain approval.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
 - .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

- .2 Manufacturer: Steel stud manufacturer shall be certified in accordance with CSSBI Standard 30M-06 and all applicable CAN/CSA standards including CSA-A660.
- .3 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials to site with manufacturer's original labels intact. Do not remove wrappings until ready for use.
- .2 No outside storage permitted. Store in clean, dry area, off ground. Provide adequate ventilation to avoid excess moisture, surface relative humidity and mould or fungal growth. Remove immediately any board showing signs of mould, mildew or fungal growth.
- .3 Stack gypsum board flat on level and dry surface without overhanging boards. Prevent sagging and damage to edges, ends and surfaces. Protect bagged Products from moisture or wetting.

1.8 PROJECT CONDITIONS

- .1 Cooperate and coordinate with Sections applying wet trades and trades installing mechanical and electrical services. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged. Do not Install work of this Section in any area unless satisfied that work in place has dried out and that no further installation of materials requiring wetness, moisture or dampness is contemplated. Relative humidity in area of work of this Section shall not exceed 55% for duration of Project. Coordinate stud layout at partitions accommodating wall mounted fixtures by other trades.
- .2 Ensure temperature of surrounding areas is minimum 13 deg C (55 deg F) and maximum 21 deg C (70 deg F) for 7 Days before and during application of gypsum board; maintain for 4 Days thereafter. Ensure heat is provided at appropriate time before work has started to bring surrounding and adjacent materials up to required temperature and maintained as specified. Avoid concentrated or irregular heating during drying by means of deflectors or protective screens.
- .3 Ensure ventilation is provided for proper drying of joint filler and adhesive and to prevent excessive humidity. Do not force dry adhesives and joint treatment.
- .4 Provide protection of materials and work of this Section from damage by weather and other causes. Protect work of other trades from damage resulting from work of this Section. Make Good such damage immediately.
- .5 Coordinate installation and cooperate with mechanical and electrical trades to accommodate mechanical electrical items and any other work required to be incorporated into or coordinated with ceiling and soffit systems.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- .1 Products of following manufacturers may be acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
 - .1 Metal Framing:
 - .1 Bailey Metal Products Ltd.; www.bmp-group.com

- .2 Dietrich Metal Framing; www.detrichmetalframing.com
- .3 Gordon Incorporated.; www.gordongrid.com
- .4 Trim-Tex Inc.; www.trim-tex.com
- .5 Roll Formed Specialty; www.rollformed.com
- .6 Unifix Inc.; www.unfixinc.ca
- .7 Chicago Metallic; www.chicagometallic.com
- .2 Gypsum Board and Accessories:
 - .1 CertainTeed Gypsum Canada Inc.; www.certainteed.com
 - .2 CGC Inc; www.cgcinc.com
 - .3 Georgia-Pacific Canada, L.P.; www.gpgypsum.com
- .2 Comparable Products from manufacturers listed herein offering functionally and aesthetically equivalent products in Consultant's opinion, and subject to Consultant's review, will be considered provided they meet the requirements of this Specification.

2.2 DESCRIPTION

- .1 Design and Performance Requirements:
 - .1 Interior Finishes:
 - .1 Ensure interior finishes are of qualities of being maintained during cleaning operations and capable of infection prevention and control in all patient care areas.
 - .2 Interior Wall Framing:
 - .1 Interior wall framing shall comply with all applicable standards listed in Ontario Building Code, including Canadian Sheet Steel Building Institute Standards (CSSB1) for materials and workmanship for interior walls, including steel studs and furring and gypsum board ceiling suspension systems.
 - .2 Construct steel stud framing to accommodate electrical, plumbing and other services in partition cavity and to support fixtures, wall cabinets, medical equipment and other such wall-mounted items. Provide reinforcement and backing.
 - .3 Gypsum Partition Design:
 - .1 Typical interior partitions shall be of depth indicated on Drawings with metal studs spaced at intervals specified in this Section with minimum 1 layer of 15.9 mm thick (5/8") gypsum board on each side. Provide heavier gauges where required for extra unsupported height or wall-mounted accessories or equipment mounting.
 - .2 Provide moisture resistant gypsum board (MRGB) at all wet areas and toilet rooms. Provide tile backer board at walls surrounding showers. Refer to Drawings for exact locations.
 - .3 As a minimum, Provide full height partitions at following locations:
 - .1 mechanical, electrical, security, and telecommunications rooms, stairs, elevator shafts, chases and toilets, at fire rated walls, private offices, conference rooms, and break rooms unless otherwise indicated on Drawings.

- .4 Ensure partition design can accommodate following loadings with deflection not exceeding L/240 in any direction:
 - .1 Minimum Lateral Load for Partitions: 0.24 kPA (5 psf)
- .4 Reinforcing:
 - .1 Provide reinforcing where required to support manufactured component items such as washroom accessories, casework/millwork, wall mounted equipment, expansion control covers, similar items.
 - .2 Provide boxed double studs at each door jamb.

2.3 MATERIALS

- .1 Framing Members:
 - .1 Comply with ASTM C754 for steel framing and conditions indicated.
 - .2 Steel Sheet Components: Comply with ASTM C645 requirements for metal, unless otherwise indicated.
 - .3 Minimum base-metal thicknesses indicated in this Section are minimums, Provide heavier thicknesses where required at unrestrained heights, to frame openings or for impact resistance requirements.
 - .4 Ensure all studs are screwable with crimped web and returned flanges and in maximum continuous lengths practicable.
 - .5 Provide knockout openings in stud webs at 600 mm (24") oc to accommodate (if required) horizontal mechanical and electrical service lines and bracing.
 - .6 Galvanized sheet steel: Conforming to ASTM A653/A653M, structural and commercial quality sheets; specially treated by phosphate conversion process if steel is to be exposed and finish painted.
 - .7 Hot-Dip Galvanizing: Conforming to ASTM A123/A123M, for galvanizing steel and iron Products; and ASTM A153/A 153M, for galvanizing steel and iron hardware.
 - .8 Protective Coating: All framing members shall be coated as follows: ASTM A653/A653M, G60 (Z180) unless otherwise noted.

2.4 FRAMING COMPONENTS

- .1 Partition Framing (Studs, Channels, Furring etc.):
 - .1 Regular Steel Studs:
 - .1 Minimum Base-Metal Thickness: 18 mils (0.0179" – 0.455 mm – 25 ga – Not Painted
 - .2 Depth: As indicated on Drawings.
 - .3 Locations: all gypsum board partitions unless otherwise indicated.
 - .2 Heavy Duty Steel Studs:
 - .1 Minimum Base-Metal Thickness: Not less than 20 ga studs.
 - .2 Depth: As indicated on Drawings.
 - .3 Locations: Where required for unrestrained heights or in openings.
 - .3 Furring Channels: Conforming to ASTM C645.

- .4 Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - .1 Acceptable Products: "Multi-Slot Track" by Bailey complete with Bailey Top Deflection Clip (TDC) or VertiClip SLD or VertiTrack VTD Series by The Steel Network Inc; www.steelnetwork.com to accommodate anticipated deflections and loadings or approved equivalent.
- .2 Concealed Reinforcing:
 - .1 Sheet Steel Reinforcing and Backing Plates: Steel sheet for blocking and bracing in locations, lengths and widths indicated on Drawings.
 - .1 Minimum Base-Metal Thickness: Minimum 43 mils (0.0428" – 1.087mm – 18ga – Yellow) commercial quality cold rolled galvanized sheet steel.
 - .2 Structural Shapes, Plates, Reinforcements: 3 mm (1/8") New material conforming to CSA G40.20 and CSA G40.21, Grade 300W. Hot dipped galvanizing with minimum zinc coating of 600 g/m² to ASTM A153/A 153M
 - .3 Metal Studs used as Reinforcements: Minimum 43 mils (0.0428" – 1.087mm – 18ga – Yellow) studs as specified herein in locations indicated on *Drawings* and as required to support building components.
 - .1 Depth: As indicated on Drawings.
 - .4 Knee brace kit for partial height partitions:
 - .1 Tube: 50 mm x 50 mm (2' x2"); wall thickness: 3 mm (1/8")
 - .2 Baseplate: 88 mm x 127 mm x 9 mm (3-1/2" x 5" x 3/8") complete with 4 holes with 10 mm (7/16") diameter.
 - .3 Finish: flat black primer to yield corrosive resistant surface compatible with joint compounds and interior finishes.
 - .4 Height: to suit partial height partitions.
 - .5 Acceptable Products: "SKB Knee Brace Kit" by Pittcon Softforms LLC or approved equivalent.

2.5 BOARD TYPES

- .1 Interior Board Types:
 - .1 General-Purpose Gypsum Board (GB): Conform to ASTM C1396M. Unless indicated otherwise use 15.9 mm (5/8") thick by 1200 mm (4') wide standard facing board in maximum continuous lengths up to 3600 mm (12') with beveled and/or tapered edges with butted square ends to suit design requirements:
 - .1 Walls: Provide 15.9 mm (5/8") (Type X) thick with tapered edges unless otherwise specified.
 - .1 Acceptable Products:
 - .1 "Sheetrock® - Regular Gypsum Panels" by CGC
 - .2 "ToughRock® Gypsum Boards" by Georgia-Pacific Canada, L.P.
 - .3 "Type X Drywall" by CertainTeed Canada

- .2 Fire Rated Gypsum Board (GB): ASTM C1396M, Type X, 15.9 mm (5/8") thick by 1200 mm (4') wide gypsum board in maximum practical lengths and tapered edges as required by each fire resistance assembly.
 - .1 Acceptable Products:
 - .1 "ToughRock® Fireguard or Fireguard C" by Georgia-Pacific Canada, L.P.
 - .2 "Sheetrock Firecode or Firecode C Core" by CGC Inc.
 - .3 "Type X or Type C Indoor Air Quality Gypsum Board" by CertainTeed Gypsum Canada Inc.
 - .2 Moisture Resistant Gypsum Board (MRGB): 15.9 mm (5/8") (Type X) thick glass mat reinforced board with moisture treated core conforming to ASTM C1658M and ASTM C1396M with following characteristics:
 - .1 Mold Resistance Rating: 10 with no mold growth after 4 weeks exposure in accordance with ASTM D3273.
 - .2 Permeance (for tile backer boards at showers and other areas exposed to high moisture only): < 85.71 ng/(Pa s m²) when tested with no tile or coating and in accordance with ASTM E96.
 - .3 Boards containing paper or other organic materials in their composition are not acceptable.
 - .4 Acceptable Fiberglass mat faced (Paperless)Products:
 - .1 Regular-purpose type (limited moisture exposure e.g sink backsplashes):
 - .1 "Dens Armor Plus High performance Interior Panel" by Georgia-Pacific Canada, L.P.
 - .2 "SheetRock Brand Glass-Mat Panel – Mold Tough" by CGC
 - .3 approved equivalent containing no paper or organic materials in core assembly.

2.6 JOINT TREATMENTS

- .1 Conforming to ASTM C475 and gypsum board manufacturer's recommendations. Confirm all Products with board manufacturer prior to application.
- .2 For fire rated assemblies ensure setting compound is tested in accordance with ASTM E814 and ULC-S115 for required rating.
- .3 Joint Tape:
 - .1 Interior Boards:
 - .1 General-Purpose Gypsum Board: Minimum 50 mm (2") wide kraft paper tape with feathered edges or fibreglass tape as recommended by manufacturer.
 - .2 Moisture-resistant gypsum board: Minimum 50 mm (2") wide mould resistant fibreglass mesh tape as recommended by panel manufacturer.
- .4 Joint Compound: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - .1 Interior Applications: Minimum application of 3 coats.
 - .1 Prefilling: At open joints and damaged surface areas, use setting-type taping compound as recommended by panel manufacturer.

- .2 General-Purpose Gypsum Board:
 - .1 1st Coat (Embedding): Setting-type taping or drying-type, all-purpose compound as recommended by panel manufacturer for embedding tape and first coat on joints, fasteners, and trim flanges.
 - .1 Use setting-type compound for installing paper-faced metal trim accessories.
 - .2 2nd Coat (Fill Coat): Use setting-type, sandable topping or drying-type, all-purpose compound as recommended by panel manufacturer.
 - .3 3rd Coat (Finish Coat): For third coat, use setting-type, sandable topping or drying-type, all-purpose compound as recommended by panel manufacturer.
- .3 Moisture resistant gypsum board (MRGB):
 - .1 1st Coat: High density setting-type taping, low shrinkage type compound.
Acceptable Products:
 - .1 "Durabond 90 Compound" by CGC Inc.,
 - .2 "High Density 90 - ProRoc" by CertainTeed Canada Inc
 - .2 approved equivalent as recommended by panel manufacturer
 - .3 2nd Coat (Fill Coat): use drying-type, all-purpose compound as recommended by panel manufacturer.
 - .4 3rd Coat (Finish Coat): use drying-type, all-purpose compound as recommended by panel manufacturer.
 - .5 Skim Coat (where MRGB is left exposed): high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.
- .4 Sealant for Moisture Resistant Gypsum Board Edges: *Provide* water resistant sealant as recommended by gypsum board manufacturer and acceptable to Consultant.

2.7 TRIMS AND ACCESSORIES

- .1 Conforming to ASTM C1047 and gypsum board manufacturer's recommendations, *Provide* accessories used in conjunction with gypsum board assemblies to protect edges, corners and for design features. Confirm all Products with board manufacturer prior to application.
- .2 Joint and Corner Trims: *Provide* paper-faced metal or plastic products as specified herein.
 - .1 Paper-Faced Metal (dry locations only): *Provide* "CGC Beadex® Brand Paper-Faced Metal Drywall Beads And Trims" by CGC or approved equivalent in following shapes.
 - .1 Cornerbead.
 - .2 Bullnose bead.
 - .3 Bullnose Cornerbead: With notched or flexible flanges.
 - .4 LC-Bead: J-shaped; exposed long flange receives joint compound.
 - .5 L-Bead: L-shaped; exposed long flange receives joint compound.
 - .6 U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - .7 Control joints.

2.8 AUXILLIARY MATERIALS

- .1 Provide auxiliary materials that comply with referenced installation standards.
- .2 Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
 - .1 Screws for Sheet Steel Members: ASTM C954, self-drilling, self-tapping gypsum board screws. Provide minimum 25 mm (1") long, #6 for single layer application; and minimum 38 mm (1-1/2") long #7 for double layer application meeting following requirements:
 - .1 For single layer application over metal framing: self-drilling, self-tapping, case hardened, No. 6 contoured Phillips head or Type S bugle head. Fasteners to be corrosion resistant. Use drill point screws for abuse resistant gypsum panels.
 - .2 For double layer application over gypsum backing board and existing gypsum board; 38 mm (1-1/2") Type G bugle head. For each additional layer of board, increase length of fasteners proportionally.
- .3 Access Doors for Architectural, Mechanical and Electrical: Where supplied by Division 21, 22 23 and 26 shall be installed under this Section.
 - .1 Flush Non-Rated Access Doors and Frames: Fabricated from galvanized sheet steel.
 - .1 Door: Minimum 1.5 mm (0.060") sheet metal, set flush with exposed face flange of frame.
 - .2 Frame: Minimum 1.5-mm (0.060") thick sheet metal with 25-mm (1") wide, surface-mounted trim.
 - .3 Hinges: Spring-loaded, concealed-pin type or Continuous piano as required.
 - .4 Latch: cylinder lock and key.
 - .5 Size: As indicated on *Drawings*, minimum 16" x 16".
 - .6 Acceptable *Products*: "N/W Series, Flush Non-Rated Access Panels" by Nystrom Building Products; www.nystrom.com or "DW-5040" by Acudor Products Inc.; www.acudoracornltd.com or approved equivalent

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Site Verification of Conditions:
 - .1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
- .2 Examine substrate for compliance with applicable requirements, including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.
- .3 Do not proceed until unsatisfactory conditions have been corrected. Beginning of installation shall indicate acceptance of substrate conditions.

3.2 PREPARATION

- .1 Provide adequate ventilation to eliminate excessive moisture before commencing and during work to ensure proper drying of joint filler and adhesive. Do not force dry adhesive and joint treatment.
- .2 Give minimum 48 hours notice for Consultant's inspection of internal wall/partition elements and services prior to concealing with gypsum board.

3.3 INSTALLATION

- .1 Comply with ASTM C754 unless otherwise indicated.
 - .1 Interior Gypsum Board Assemblies: Comply with requirements in ASTM C840 that apply to framing installation. Provide partitions complete to underside of structure, unless otherwise indicated on Drawings.
 - .2 Refer to Drawings for partition types and their respective sound attenuation and fire-rating requirements.
 - .3 Conform to installation recommendations contained in *CGC Drywall Steel-Framed Systems* for metal stud partitions, ceilings, column fireproofing and bulkhead detailing.
- .2 Install supplementary concealed reinforcement framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- .3 Install bracing at terminations in assemblies.
- .4 Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 FRAMING SYSTEMS

- .1 Gypsum Board Partitions:
 - .1 Install studs so flanges within framing system point in same direction.
 - .2 Co-ordinate erection of studs and installation of service lines.
 - .3 Provide continuous gasket between floor tracks and structure to separate metal framing from masonry and/or concrete.
 - .1 Provide isolation strips under steel studs runners for stud walls constructed on slab on grades, slabs above grades, stud at roofing curbs and stud on below grade concrete slabs.
 - .2 Install resilient sponge tape where gypsum board ceilings abut heads of door frames and where wallboard abuts heads or jambs of exterior door and window frames.
- .4 Space studs as follows:
 - .1 Single-Layer Application: 400 mm (16") o.c., unless otherwise indicated.
 - .2 Multilayer Application: 400 mm (16") o.c., unless otherwise indicated.
 - .3 Tile backing panels: 400 mm (16") o.c., unless otherwise indicated.
- .5 Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling. Align accurately.

- .6 Deflection Tracks: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
- .7 Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - .1 Install two heavy duty boxed studs at each side of openings. Extend each stud through suspended ceilings and attach to underside of overhead structure.
 - .2 Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (12.7-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
- .8 Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- .9 Metal Furring:
 - .1 Provide furring rigid, secure, square, level or plumb, framed and erected to maintain finish dimensions and contours indicated. Allow for thermal movement.
 - .2 Provide furring around ducts, pipes and dropped beams occurring in finished areas and for vertical gypsum board breaks within or at termination of ceilings.
 - .3 Provide metal furring channels fastened to masonry or concrete surfaces in parallel rows at 400 mm (16") oc unless gypsum board is indicated to be adhered directly to masonry or concrete surfaces. Shim metal furring channels to Provide a level surface.
- .10 Concealed Reinforcements in Partitions:
 - .1 Provide hollow structural steel, stud, angle and steel plate sections, galvanized sheet steel as specified herein where required to support manufactured components.
 - .2 Provide rigid and secure installation capable of offering resistance to minimum pull force requirements specified herein. In general weld connections.
 - .3 Install stud spacer bars specified herein as required to restrain studs against lateral and torsional movement, and to Provide supplementary horizontal bracing.
 - .4 Sheet Steel Reinforcing/Backing Plate: Provide galvanized sheet steel plate as specified herein where required to support manufactured components. Do not use wood blocking for this purpose. Provide additional sheet plates, reinforcing framing studs, angles, furring channels secured between studs and other accessories to support components including, but not limited to:
 - .1 architectural woodwork.
 - .2 wall mounted miscellaneous specialties and equipment.
 - .5 Concealed Knee Brace for Low Wall Partitions: *Install* in accordance with manufacturer's recommendations.

3.5 INTERIOR BOARD APPLICATION

- .1 Provide gypsum board in accordance with manufacturer's written installation instructions and finish to requirements of ASTM C840. Provide finished work plumb, level and true, free from perceptible waves or ridges and square with adjoining work.

- .2 Provide gypsum board perpendicular to framing and in lengths that will span ceilings and walls without creating end (butt) joints. Stagger abutting end joints of adjacent panels not less than one framing member. Accurately fit exposed butt joints together and make edges smooth.
- .3 Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1.5 mm (1/16") of open space between panels. Do not force into place.
- .4 Maintain wallboard panels minimum 6 mm (1/4") and maximum 13 mm (1/2") above floor to prevent moisture transfer. Extend panels to underside of deck or structure.
- .5 Isolate perimeter of gypsum board applied to non-load-bearing partitions (except shaft walls) at structural abutments, except floors. Provide 6 mm (1/4") wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- .6 Erect plain wallboard vertically or horizontally, whichever results in fewer end joints. Keep end joints away from prominent locations and central portions of ceilings. Locate vertical joints at least 300 mm (12") from jamb lines of openings.
- .7 Cut and fit gypsum board to accommodate or fit around other parts of Work. Apply sealant beads at perimeter of services and similar objects which penetrate wallboard in accordance with manufacturer's directions.
- .8 Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.). Do taping and filling of concealed surfaces above ceiling line, at fire rated and sound rated partitions and walls.
- .9 Fasten gypsum board to metal furring and metal studs with screws. Space screws at 200 mm (8") oc at board edges and 300 mm (12") oc on board field. Ensure perimeter screws are not less than 9 mm (3/8") nor more than 13 mm (1/2") from edges and ends are opposite screws on adjacent boards.
- .10 Do not secure gypsum board by installing screws into aluminum or steel window and door frames. At fire-rated assemblies, reduce spacings to comply with labelling authorities assembly listings. For other specialty boards screw spacing shall be in accordance with manufacturer's recommendations.
- .11 Joint Treatment:
 - .1 Mix joint compound or ready-to-use compounds according to manufacturer's directions. Use pure, unadulterated, clean water for mixing. Do not use set or hardened compound.
 - .2 Tape and fill joints and corners in accordance with gypsum board manufacturer's printed instructions. Fill either manually, using hand tools or by mechanical taping and filling machine of proven efficiency.
 - .3 Allow sufficient drying time between coat applications and prior to sanding. Conform to manufacturers' instructions.
 - .4 Provide finished work smooth, seamless, plumb and true, flush and with square plumb neat corners.
- .12 Single-Layer Application:
 - .1 Partitions/walls: apply gypsum panels with long dimension parallel to supports, unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints. Locate end joints over supporting members. Locate vertical joints at least 300 mm (12") from jamb lines of openings.
 - .2 Fastening Methods: Apply gypsum panels to supports with steel drill screws as specified herein. Ensure perimeter screws are not less than 9 mm (3/8") and not more than 13 mm (1/2") from edges and ends of adjacent boards.

- .3 Joints: Finish all joints unless specified otherwise.
- .13 Multilayer Application:
 - .1 Lay out work to minimize end joints on face layer. Offset parallel joints between face and base layers by at least 250 mm (10") and to apply face layer at right angles to base layer.
 - .2 Base Layer: Same as face layer unless otherwise indicated on *Drawings*.
 - .3 Partitions/walls: Apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 - .4 Fastening Methods: Fasten base layers with screws spaced 300 mm (12") oc; fasten face layers with adhesive with notched spreader to leave 9 mm x 13 mm (3/8" x 1/2") ribbons, 38 mm (1-1/2") apart over entire back side of face layer. Provide supplementary fasteners. Follow manufacturer's recommendations for adhesive application. Temporarily brace or fasten gypsum panels until fastening adhesive has set.
 - .5 Joints: Finish joints in face layers only, unless otherwise required to achieve fire resistant ratings indicated. Setting compound for fire rated construction shall conform to requirements of authorities having jurisdiction to obtain fire rating shown on *Drawings*.
- .14 Moisture Resistant Gypsum Board:
 - .1 Install in locations indicated on *Drawings*. Ensure moisture resistant gypsum board is installed on any wall/partition containing a plumbing fixture (i.e. water closets, sinks, tubs, etc.) whether or not explicitly shown on *Drawings*.
 - .2 Provide in accordance with manufacturer's written installation instructions.
 - .3 Install with 6 mm (1/4") gap where panels abut other construction or penetrations.
 - .4 Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.
 - .5 Joint Finish: Ensure surface is smooth and free of tool marks and ridges.
 - .1 All joints and interior angles shall have fiberglass tape embedded in high density setting joint compound as specified herein. Provide 2 separate coats of joint compound applied over all flat joints and 1 separate coat of joint compound applied over interior angles.
 - .2 Cover fasteners heads and accessories with 3 separate coats of joint compound.
 - .3 Conform to manufacturer's instructions.

3.6 APPLICATION OF TRIMS AND ACCESSORIES

- .1 For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- .2 Control Joints:
 - .1 Form control and expansion joints with space between edges of adjoining gypsum panels. Provide pre-fabricated, pre-manufactured control joints unless otherwise indicated.
 - .2 Provide control joints full height (floor-to-ceiling or door header-to-ceiling) in partitions and furring runs.
 - .3 Provide control joints from wall to wall in ceiling areas.

- .4 Provide continuous polyethylene dust barrier behind and across control joints.
- .5 Install control joints at locations indicated on Drawings and in accordance with requirements of ASTM C840 but not more than 9000 mm (30') on centre. As a minimum *Install* control at following locations:
 - .1 at both sides of frames ().
 - .2 at locations where changes in support framing/construction occurs.
- .6 Obtain Consultant's approval for exact locations of control joints.
- .3 Joint and Corner Trim:
 - .1 Provide interior trims and beads at reveals, ceiling-wall intersections, partition perimeters; and at intersection of dissimilar constructions such as gypsum board-to-concrete or gypsum board-to-acoustic tile ceilings.
 - .2 Provide metal trim and beads where gypsum board abutts against a surface having no trim concealing junction.
 - .3 Provide 13 mm (1/2") separation gasket between interior trim and window frames or other cold surfaces or Provide sponge tape between gypsum board framing, where such framing abuts exterior door or window frame. Tape shall be either full width or 1 strip of 9 mm (3/8") wide on each side of framing member.
 - .4 Unless otherwise indicated on *Drawings*, Install trims as follows:
 - .1 Cornerbead: at outside corners, unless otherwise indicated.
 - .2 U-Bead and LC-Bead: at exposed panel edges.
- .4 Aluminum Wall Trims and Reveals:
 - .1 Provide metal trim casing bead or reveals at junctions with dissimilar materials as indicated on Drawings.
 - .2 Install in locations indicated on Drawings.
- .5 Access Doors and Panels: Install access doors and panels supplied as part of work of Divisions 21, 22, 23 and 26 and where required as part of work of this Section. Coordinate with other Sections for locations and sizes.
 - .1 Install access panels in accordance with manufacturer's instructions.
 - .2 Install access panels in locations including but not limited in walls, bulkheads, ceilings and soffits. Final locations to be determined by coordination with trades installing mechanical, electrical and other building services.
 - .3 Consultant reserves right to relocate access panels up to 3600 mm (12') from locations shown on Drawings due to site conditions, providing ample warning is given prior to installation.

3.7 TOLERANCES

- .1 Framing Tolerances: Install each framing member so fastening surfaces vary not more than 3 mm (1/8 ") in 3000 mm (10'-0") in any direction.

3.8 CLEANING

- .1 Cooperate and coordinate with other Sections to obtain satisfactory gypsum board finish work. Do all cutting, patching and Make Good as required by installation of work of other Sections.

- .2 Clean off beads, casings, joint cement droppings and similar items and remove surplus materials and rubbish on completion and as directed.

3.9 FIELD QUALITY CONTROL

- .1 Carry out work using skilled tradesmen carefully supervised by competent foremen. Take all measurements accurately.

3.10 GYPSUM BOARD FINISHING SCHEDULE

- .1 Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- .2 Prefill open joints and damaged surface areas.
- .3 Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- .4 Finish panels to levels indicated below and according to ASTM C840:

Finishing Level	General Areas	Final Appearance
0	Temporary construction areas and unfinished construction areas.	Unfinished
1	Plenum areas above ceilings, service corridors or any places not viewed by public and where assembly would generally be concealed.	Tool marks and ridges are acceptable.
2	Following Areas: - where moisture resistant gypsum backing board (MRGB) is used as substrate for tile; -exposed assemblies in garages, warehouse storage areas and service corridors.	Tool marks and ridges are acceptable. Thin coating of compound covers tape; one coat compound over fastener heads.
3	Areas scheduled to receive textured finishes (spray or hand applied) and not subject to critical lighting.	No marks or ridges. Ready for priming, to be followed by textured finish.
4	All public exposed areas where flat, velvet, eggshell paints, glazed coatings, light textured finishes (including wall protection items) are scheduled to be applied.	No marks or ridges. Ready for priming.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* acoustic tile ceilings including but not limited to following:
 - .1 ceiling suspension systems.
 - .2 lay-in acoustic ceiling panels.
 - .3 accessories
 - .4 metal edge moldings and trims
 - .5 auxiliary materials required for a complete installation.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Division 01.

1.5 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for *Project* in accordance with requirements of Division 01. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
- .3 *Shop Drawings*: Submit *Shop Drawings* for work of this Section in accordance with Division 01. In addition to minimum requirements indicate following:
 - .1 Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
 - .1 Ceiling suspension system members including joint pattern.

- .2 Method of attaching hangers to building structure and termination at walls partitions, bulkheads, lighting fixtures and mechanical fixtures.
 - .3 Structural members to which suspension systems will be attached.
 - .4 Supply layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - .5 Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - .6 Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
- .2 Submit *Shop Drawings* detailed in measurement system (e.g. imperial or metric) to match *Drawings*.
- .4 Certificates:
- .1 Submit independent test data and design tables for each type of insert to be employed on this *Project* for hanger supports.
 - .2 Submit certification from structural engineer registered in Province of Ontario stating that installed suspended ceiling systems are capable of supporting their own weight and weight of lighting, grilles and other mechanical and electrical fixtures required by Mechanical and Electrical Divisions.
 - .3 Obtain approval of electrical utility authorities having jurisdiction for support of light fixtures, by ceiling grid and supports, to satisfy requirements of electrical inspection department of Local Hydro Company. Adjust grid, fixing devices and support hangers as required to obtain approval.
 - .4 Submit written confirmations to Divisions 22, 23 and 26, when requested by Consultant, that suspended ceiling is capable of supporting additional weight of mechanical and electrical fixtures specified in Division 22, 23 and Division 26.
- .5 Maintenance Data: Submit maintenance instructions to *Owner* for recommended cleaning materials and methods for panels and trim. Include precautions for use of and composition of cleaning materials detrimental to acoustic materials and trim.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
- .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
 - .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.
- .2 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in original packages, containers and bundles, bearing brand and manufacturer's name and ULC or cUL labels.
- .2 Store materials in a covered area, off ground, on flat, smooth, dry surfaces. Protect from moisture. Remove damaged or deteriorated materials from site.

- .3 Comply with ceiling panel manufacturer's recommendations regarding temperature and humidity conditions before, during and after ceiling installation.

1.8 PROJECT CONDITIONS

- .1 Environmental Requirements: Continuously maintain rooms or areas scheduled to receive acoustical ceilings at not less than 21 deg C (70 deg F), and at occupancy humidity, at least 3 Days prior to installation and 3 Days after work is completed.
- .2 Schedule work to eliminate risk of damage to these materials due to adverse environmental conditions in rooms or areas when and after work is installed.

1.9 WARRANTY

- .1 Warrant work of this Section for period of 3 years from Substantial Performance of the Work against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of *Consultant* and at no expense to *Owner*.

1.10 MAINTENANCE

- .1 Supply extra materials described below for Owner's future maintenance use that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - .1 Acoustical Tile Ceilings: Full-size panels equal to 2.0 % of quantity installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- .1 Products of following manufacturers may be acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
 - .1 Armstrong Ceilings Canada Ltd.; www.armstrong.com
 - .2 CGC/USG Inc.; www.cgcinc.com
 - .3 CertainTeed Canada; www.certainteed.com
 - .4 Rockfon; www.rockfon.com
- .2 Comparable Products from manufacturers listed herein offering functionally and aesthetically equivalent products in Consultant's opinion, and subject to Consultant's review, will be considered provided they meet the requirements of this Specification.

2.2 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Ceiling panels to meet fire response characteristics equivalent to Class A per ASTM E1264 (Flame Spread Rating: 25 or under; Smoke Developed: 50 or under; Fuel Contributed: 25 or under)
- .2 Design Requirements:
 - .1 Design suspension system to support lighting fixtures according to CSA C22.1, including local provincial amendments and requirements, and submit certification in accordance with Rule 30-302;

- .2 Design suspension system to support safely and without distortion entire ceiling system and superimposed loads of:
 - .1 lighting fixtures,
 - .2 Air supply diffusers, boots, fire alarm grilles and exhaust and return air grilles;
 - .3 suspension members of curtain tracks;
 - .4 Power grid system, as required.
- .3 Prepare panels for sprinkler head penetrations.
- .4 Coordinate installation and cooperate with Mechanical and Electrical Subcontractors, to accommodate mechanical and electrical items, or any other work required to be incorporated in or coordinated with the ceiling system.

2.3 MATERIALS

- .1 Commercial quality cold rolled steel 0.179" (26 ga) minimum thickness, and heavier gauge for Heavy Duty as necessary, galvanized to zinc coating designation Z275.
- .2 Exposed surfaces of metal *Products* shall be factory finished in non-yellowing, low sheen satin white enamel to *Consultant's* acceptance to match whiteness in panels.
- .3 *Provide* slip-on trim mouldings or metal mouldings with baked enamel finish or exposed finished metal, as standard with grid manufacturer, to trim around light fixtures.

2.4 ACOUSTIC TILE CEILINGS

- .1 High Performance Acoustic Ceiling Tiles - Smooth, Scrubbable (Food Preparation/Cafeteria-Type) (ACT-1): conforming to CAN/CGSB-92.1-M and ASTM E1264 and as follows:
 - .1 Type and Form: Type IX, mineral base with scrubbable pigmented or clear finish; or Type XX
 - .2 Modular Size: 610 mm x 1220 mm (24" x 48")
 - .3 Thickness: ≥ 16 mm (5/8")
 - .4 Colour: White.
 - .5 Edge Detail: square
 - .6 Light Reflectance (LR): 0.80 – 0.89
 - .7 Acoustic Performance:
 - .1 Noise Reduction Co-efficient (NRC): N/A
 - .2 Ceiling Attenuation Class (CAC): ≥ 22
 - .8 Acceptable Products:
 - .1 "Kitchen Zone" by Armstrong Ceilings
 - .2 "Kitchen Lay-In Panel" by CGC/USG Inc.
 - .3 "Vinylrock" by CertainTeed Canada
 - .4 "Rockfon – Medical Standard" by ROCKFON NORTH AMERICA

2.5 CEILING SUSPENSION SYSTEM

- .1 Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C635/C635M and designated by type, structural classification, and finish indicated.
 - .1 Provide suspension system complete with splices, clips, and perimeter moulding, of manufacturer's standard and aluminum types to suit applicable conditions unless special conditions and access areas are shown or specified.
- .2 Standard Exposed Ceiling Suspension System (Wide Face): ASTM C635, 15/16 face, direct-hung system; heavy-duty structural classification.
 - .1 Finish: Factory finished in non-yellowing, low sheen satin white enamel to *Consultant's* acceptance to match panels.
 - .2 Acceptable *Products*:
 - .1 "Series "DX Quick Release" by CGC/USG Inc.,
 - .2 "Prelude XL" by Armstrong Ceilings,
 - .3 "Chicago Metallic 1200 System" by Rockfon North America,
 - .4 "Classic Stab System" by CertainTeed Canada,

2.6 ACCESSORIES

- .1 Hangers: Minimum 0.104" (12 ga) overall thickness galvanized steel wire to zinc coating designation Z275, meeting "Heavy-duty" classification of ASTM C635.
- .2 Main Tees: 3.66 m (12') long, 23.8 mm (15/16") face width double web design, rectangular bulb at top of web, 38 mm (1-1/2") web height. Expansion cut-outs in main tees controlling buckling caused by heat expansion.
- .3 Main Tee Splices: Designed to lock lengths of main tees together so that joined lengths of tee function structurally as single unit with tee faces at joint perfectly aligned and presenting tight seam.
- .4 Cross Tees: 1220 mm (4') long, 25 mm (1") web height structural cross-section, design same as main tees, designed to connect at main tees forming positive lock without play, loss or gain in grid dimensions with offset over-ride of face flange over main tee flange to provide flush joint. *Provide* 38 mm (1-1/2") web height of cross-tee for fire rated assemblies.
- .5 Hanger Attachments: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as indicated in ASTM C635 and as determined by testing according to ASTM E488 by an independent testing agency.
 - .1 Basis-of-Design: "Suspended Ceiling Clips – X-CX Series" by Hilti Canada Inc. or approved equivalent.
- .6 Fasteners: Galvanized and of size suited to loading conditions.
- .7 Supplementary Steel Supports: Steel conforming to Section 05 50 00.
- .8 Seismic Stabilizer Bars, Struts and Clips: Manufacturer's standard pre-engineered units designed and tested to accommodate seismic forces for design category specified in this Section.

- .9 Metal Closures and Trims: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and colour as that used for exposed flanges of suspension-system runners. Provide in radii indicated on Drawings, where applicable.
 - .1 Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
 - .2 For lay-in panels with reveal edge details, provide stepped edge moulding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
 - .3 For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
 - .4 Acceptable Products:
 - .1 "Compasso Trim" by USG/CGC/USG Inc.
 - .2 "AXIOM" by Armstrong Ceilings.
 - .3 "Infinity Trim" by Rockfon.
 - .4 "Terminus Perimeter Trim" by CertainTeed Canada
- .10 Acoustical Sealant: Conforming to requirements of Section 07 92 00
 - .1 Gun applied, smoke-rated and acoustic sealant: ASTM C834, Type P, Grade -18°C and ASTM C920, Class 12.5.
 - .1 Flammability: ASTM E84 and CAN/ULC S102 Class A.
 - .2 Mold resistance: Complying with ASTM G21.
 - .3 Acceptable Products:
 - .1 QuietZone Acoustic Sealant" by Owens-Corning Canada Inc.
 - .2 "Tremstop Acrylic Acoustical Sealant" by Tremco Ltd.
 - .3 "SilentFX® Noise Proofing Sealant by CertainTeed Inc. "QuietSeal Pro" by Pabco Gypsum.
 - .4 "CP506 – Smoke and Acoustic Sealant" by Hilti (Canada) Limited; www.ca.hilti.com or approved equivalent.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Site Verification of Conditions:
 - .1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
 - .2 Inspect substrates and previously placed work to determine suitability and completeness. Start of work constitutes an acceptance of existing conditions, and failure of work due to unsatisfactory existing conditions shall be corrected at no cost to *Owner*. Similarly, if work needs to be removed to correct defects in substrates or previously placed work, both removal and replacement shall be done at no cost to *Owner*.
- .2 Do not commence installation until all work above suspended ceiling has been completed, inspected and accepted.

- .3 Do not start installation until exterior glazing has been completed and exterior openings are closed in. Ensure wet work is completed and dried out to a degree acceptable to panel manufacturer before installation is commenced.

3.2 PREPARATION

- .1 Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- .2 Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

- .1 Install ceiling panels and metal suspension system in accordance with applicable requirements of ASTM C636, reviewed Shop Drawings and manufacturer's directions.
- .2 *Install* acoustic ceilings using tradesmen skilled in this class of work, in accordance with manufacturer's instructions and as specified herein. Where manufacturer's directions are at variance with *Contract Documents*, notify *Consultant* before proceeding with work.
- .3 Neatly and symmetrically *Install* suspended ceiling to true lines, evenly balanced to pattern indicated on *Drawings* or as directed.
- .4 Centre ceiling system on room axis unless otherwise indicated or directed leaving equal border panels not less than 1/2 a full width.
- .5 Recessed items shall replace or be centred on acoustical panels, except where shown otherwise. Consult with Mechanical and Electrical Divisions to co-ordinate work. *Provide* additional supports where required.
- .6 Installation of Hangers:
 - .1 Install supporting inserts for hangers of suspended ceiling system into concrete slab above.
 - .2 Do not secure hangers to metal roof deck, ductwork, conduit, piping, equipment or support system for any of these. Attach hangers to building's structural members instead.
 - .3 Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - .4 Secure hangers to construction above per ASTM C636 requirements.
 - .5 Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - .6 Space hangers for suspended ceilings to support ceiling grids independent of walls, columns, pipes and ducts and as follows:
 - .1 maximum 1220 mm (4') centres along support grillage,
 - .2 not more than 150 mm (6") from ends,
 - .3 within 150 mm (6") from each corner
 - .4 maximum of 1220 mm (4') around fixture perimeters.
 - .5 Provide an additional hanger at each corner of each opening to receive a recessed lighting fixture and each opening that has been framed by main beam members.

- .6 Provide additional hangers at each diffuser, grille and other points of extra loading.
- .7 If ductwork or equipment located in ceiling plenum area interferes with hanger spacing, Provide a trapeze or other arrangement reviewed by Consultant to support main beams at proper spacing.
- .8 When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
- .9 Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- .7 Installation of Suspended Grid:
 - .1 Install direct-hung grid lay-in acoustic panel ceilings where shown. Install main tees, cross tees, and wall mouldings so bottom flanges are in flat, level plane at finish ceiling elevations.
 - .2 Erect main beams parallel to main wall and to each other; space uniformly at centres specified.
 - .3 *Supply* main beams in as long lengths as possible to minimize number of joints in a run. Join lengths of main beams together at hangers only. Make joints square, tight, flush and reinforced with concealed special splice pieces.
 - .4 Except in areas of steel framing, *Provide* hangers at each intersection of main beam and framing.
 - .5 Stop ends of main beams 13 mm (1/2") from walls allowing for expansion.
 - .6 In ceilings having recessed lighting fixtures, modify grid framing to provide main beams along and parallel to both long sides of lighting fixtures. Run main tees at right angles to length of light fixtures.
 - .7 At each 300 mm (12") wide fixture, *Provide* an additional main beam along the long side of fixture.
 - .8 At other items recessed in ceiling and designed to be framed by main beams, *Provide* additional main beams necessary. Rest ends of main beams on horizontal leg of wall mouldings.
 - .9 Install primary cross tees at right angles to main beam tees and space uniformly at centres specified.
 - .10 Join ends of cross tees to web of main beams with a positive interlock; except at light fixtures, secure members together with concealed steel clips and bolts.
 - .11 Install tees to produce fine-line joints between flanges of abutting members. Arrange grid so opposite wall edge panels are of equal width but not less than 1/2 panel width.
 - .12 Level suspended systems with a maximum tolerance of 3 mm (1/8") over 3 m (10').
 - .13 Lay out and erect grid system to provide panel patterns shown on Drawings.
 - .14 Securely tie members to hangers. Properly lock main tees and cross tees at intersections. Assemble framework to form a rigid and interlocking system.
- .8 Installation of Ceiling Panels: Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
 - .1 Arrange directionally patterned acoustical panels as indicated on reflected ceiling plans.

- .2 For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
 - .3 For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 - .4 Paint cut edges of panel remaining exposed after installation; match colour of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
- .9 Installation of Trims and Mouldings:
- .1 At locations where ceilings abut walls, columns and other vertical surfaces, *Install* continuous wall moulding to trim ceiling edges.
 - .2 *Install* moulding with bottom horizontal leg at elevation required to support acoustic panel and to be flush with bottom flange of grid members, and with vertical leg concealed.
 - .3 Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 - .4 Bolt moldings to supporting construction at 610 mm (24") on centres and within 150 mm (6") of end of each moulding piece. Provide tight, inconspicuous butt joints in moulding if several pieces are required in any one run.
 - .5 Fit panels moderately tight between upright legs of members. Cut panels neatly and accurately to fit closely around items piercing the finish ceiling plane. Provide special shapes and sized to provide a complete installation by cutting panels to fit into less than full size openings.

3.4 ADJUSTING AND CLEANING

- .1 After interior finishing work has been substantially completed, or when directed by Consultant, inspect ceiling work. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members.
- .2 Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- .3 Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.
- .4 Upon completion of Project, finished surfaces shall be clean and free from dirt and other markings and in good condition acceptable to Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* resilient base including but not limited to following:
 - .1 surface fillers, primer and adhesive.
 - .2 resilient toe bases at resilient floor areas.
 - .3 floor transitions.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Division 01.

1.5 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for *Project* in accordance with requirements of Division 01. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.

- .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.
- .2 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in good condition to site in manufacturer's original unopened containers that bears name and brand of manufacturer, *Project* identification, shipping and handling instructions.
- .2 Store on site in designated space at minimum temperature of 20 deg C (68 deg F) for period of 48 hours immediately prior to, during and after installation. Store goods in rolls only.

1.8 PROJECT CONDITIONS

- .1 *Provide* each flooring *Product* in accordance with manufacturer's recommended tolerances for:
 - .1 Substrate moisture content.
 - .2 Temperature and ventilation.
 - .3 Maintain Relative Humidity at application to % recommended by manufacturer when tested in accordance with ASTM F2170.
- .2 Environmental Requirements: Air temperature and structural base temperature at base installation are shall be above 20 deg C (68 deg F) for 72 hours before, during and 48 hours after installation. Allow base materials and application adhesives to acclimatize to these temperatures for 48 hours.

1.9 WARRANTY

- .1 Warranty resilient bases for a period of 3 years from Substantial Performance of the Work against defects and/or deficiencies in accordance with General Conditions of the *Contract*.
- .2 Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of *Consultant* and at no expense to *Owner*. Defects include but are not limited to: failure in adhesive bond and extensive colour fading.

1.10 MAINTENANCE

- .1 Extra Materials: *Supply* to *Owner* at completion of job 6000 mm (20'-0") of coil stock of each type of resilient base in colours specified for future repairs, boxed in original containers and clearly labeled. Extra stock shall be same production run as installed *Products*. Store extra stock in location as directed later by *Consultant*.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- .1 Products of following manufacturers may be acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
 - .1 Flexco; www.flexcoFloor.com

- .2 Johnsonite Division of Duramax Inc.; www.johnsonite.com
- .3 Roppe.; www.roppe.com

2.2 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Surface burning characteristics: *Provide Product* with following flame spread rating and smoke developed rating when tested in accordance with following standards:
 - .1 Critical Radiant Flux (ASTM E648 or NFPA 253): > 0.45 watts/cm² – Class I
 - .2 Smoke Developed (ASTM E662): ≤ 450
 - .3 CAN/ULC-S102.2-M: Maximum Flame Spread: 100.
 - .2 Design and Performance Requirements:
 - .1 Provide materials free from blisters, cracks, chipped edges and embedded foreign matter or other defects.
 - .2 Comply with applicable regulations regarding VOC (volatile organic compound) content of adhesives.
 - .3 Colour Uniformity: Use treads from consecutive manufacturing process to maintain consistent colour match between adjacent installation. Replace installed products in areas showing undue colour variation, in the opinion of the Owner or Consultant.

2.3 MATERIALS

- .1 Rubber Toe Base (RB-1) (at resilient floor areas): ASTM F1861, PVC free, Type TS (rubber, vulcanized thermoset) or TP (thermoplastic rubber), Group 1 (solid, homogeneous); smooth surface with following characteristics:
 - .1 Styles: Cove (base with toe)
 - .2 Thickness: Minimum 3.2 mm (0.125") thick
 - .3 Height: To match existing unless otherwise indicated on Drawings.
 - .4 Lengths: Coils in manufacturer's standard length.
 - .5 Corners: Job-formed using adhesive, cove former fillet radius reinforcing strips, welding rod and accessories as recommended by resilient base manufacturer.
 - .6 Colours: To be selected by *Consultant* at a later date from manufacturer's full range including designer colours.
 - .7 Acceptable *Products*:
 - .1 "Rubber Wall Base" by Johnsonite,
 - .2 "Marathon Rubber Cove Base" by American Biltrite (Canada) Ltd.,
 - .3 "Pinnacle Rubber Wall Base" by Roppe
 - .4 "Wallflowers Rubber Wall Base" by Flexco.

2.4 ACCESSORIES

- .1 Surface fillers and primers: Types and brands approved, acceptable to resilient base manufacturers for applicable conditions. Use non-shrinking latex compound.
- .2 Resilient base adhesives: Best quality, waterproof, clear setting type and brands as recommended by resilient base manufacturer and meeting VOC limits stipulated herein.

- .3 Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of flooring, and in maximum available lengths to minimize running joints.
- .4 Transition strips: Tapered vinyl strips to suit site condition for smooth transition. Provide transition strip at junction of resilient flooring with other finish flooring materials for a flush transition at the meeting edge
- .5 Joint Sealant: Provide CAN/CGSB-19.24-M, multi-component modified urethane base chemical curing sealing material compatible with adjacent materials finish and as recommended by resilient base manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Site Verification of Conditions:
 - .1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
 - .2 Ensure concrete floors are fully cured. Verify concrete floor dryness by using test methods recommended by flooring manufacturer.
 - .3 Verify curing, hardening or other admixtures have been used and if used ensure these compounds have been removed.
 - .4 Installation of flooring shall be considered an acceptance of surfaces to be covered. If repair of surfaces is required after commencement of flooring work it shall be included as part of the work specified herein.

3.2 PREPARATION

- .1 Substrates shall be:
 - .1 dry and clean;
 - .2 free of cracks, ridges, depressions, raised areas or other defects which would telegraph through and interfere with adhesion and installation of flooring;
 - .3 temperature of resilient flooring and substrate shall be within specified tolerances;
 - .4 perform moisture and adhesive bond test.
 - .5 Perform adhesive bond test in each major area, minimum 1 per 93 m² (1000 sq ft), prior to installation. Examine after 72 hours to determine whether bond is solid and no moisture is present. Do not proceed with work until results of bond test are acceptable.
- .2 Concrete shall have dampness no greater than recommended by flooring and adhesive manufacturers when tested with moisture meter. Where floors exhibit negative alkalinity, carbonization or dusting conform to manufacturers' recommendations for removal of these elements detrimental to work.
- .3 Be responsible to report conditions contrary to requirements that would prevent proper installation. Do not commence with *Work* until unsatisfactory conditions have been corrected.
- .4 Failure to report unsatisfactory conditions will be construed acceptance and approval of substrate conditions. Commencement of *Work* shall imply acceptance of substrate with regard to conditions of substrate at time of installation.
- .5 Prepare horizontal concrete substrates according to ASTM F 710.

3.3 INSTALLATION

- .1 Resilient Bases:
 - .1 Resilient base work shall be performed by experienced and competent workers in strict accordance with manufacturers written instructions for material concerned.
 - .2 Fill cracks or irregularities with crack filler approved by resilient base manufacturer. *Provide* a solid backing over entire area behind resilient base.
 - .3 Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products
 - .4 Apply primer in strict accordance with manufacturer's written instructions. Permit primer to dry.
 - .5 Apply adhesive evenly and continuously with an approved notchooth spreader at the recommended rate for full base adhesion and contact. Mechanical spreader not approved. Do not apply adhesive in a manner which promotes induced waviness in resilient base. Do not spread more adhesive than can be covered before initial set takes place. Use waterproof adhesive throughout.
 - .6 Mix and spread adhesive evenly, in quantities which can be covered by resilient base within the adhesive's working time. If the adhesive over-dries, completely remove it using solvents compatible with adhesive and re-apply adhesive. Do not soil walls, bases, fitments, finish carpentry work or adjacent surfaces with adhesive. Promptly remove all excess and spillage of adhesive.
 - .7 Unroll coils of resilient base. Place resilient base flat to loosen coil set.
 - .8 Set wall base in adhesive tightly against wall and floor surfaces. Use lengths as long as practicable and not less than 500 mm (20") long.
 - .9 *Install* resilient bases to walls, columns and fitments as indicated on the *Drawings* and Room Finish Schedule, during final stages of completion of work, when ceilings and permanent partitions are finished, when prime paint coats are applied and when surface conditions are suitable for installation.
 - .10 Set resilient base in adhesive to produce a positive, permanent bond without gaps, tight against vertical and floor surfaces for a uniform fit.
 - .11 *Install* resilient base straight and level with maximum height variation of 1:1000, having vertical, tight and flush "hairline" butt joints with no two joints closer than 2' - 0" (610mm) apart.
 - .12 Roll resilient base with clean, polished 5 lbs.(2.27 kg) roller, against vertical and floor surfaces to ensure full bonding to surfaces.
 - .13 Ensure that installation of resilient base is tight, firm, and free of bubbling and separation of any kind from surfaces. Remove defective installation as directed by *Consultant* and *Install* new resilient base as specified herein.
 - .14 Resilient base work shall be handed over to *Owner* free of blemishes and in perfect condition.
 - .15 Job-Formed Corners:
 - .1 Accurately scribe and fit resilient base to metal frames and other obstructions.
 - .2 Outside Corners: Use straight pieces of maximum lengths possible. External corners shall be wrapped around corners as sharp as possible by scoring the back. Form without producing discoloration (whitening) at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are

only deep enough to produce a snug fit without removing more than half the wall base thickness.

- .3 Inside Corners: Provide mitred internal corners. Use straight pieces of maximum lengths possible. Shave back of base where necessary to produce a snug fit to substrate.

.16 Resilient Accessories:

- .1 Comply with manufacturer's written instructions for installing resilient accessories.

3.4 CLEANING

- .1 Remove excess adhesive from floor, base and wall surfaces without damage.
- .2 Clean, seal and wax floor and base surface to flooring manufacturer's instructions.
- .3 Sweep and vacuum horizontal surfaces thoroughly.
- .4 Damp-mop horizontal surfaces to remove marks and soil.

3.5 PROTECTION

- .1 Protect installed flooring as recommended by flooring manufacturer against damage from rolling loads, other trades or placement of fixtures and equipment.
- .2 Prohibit traffic on floor for 48 hours after installation.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* painting including but not limited to following:
 - .1 Painting of all interior exposed elements noted on Room Finish Schedule exposed elements noted on *Drawings*. Do not paint excluded components indicated herein. Where an item or surface is not specifically mentioned on Room Finish Schedules or on *Drawings*, Provide same finish as similar adjacent materials or surfaces.
- .2 Work Excluded:
 - .1 Do not paint pre-finished metal siding, fascia and soffit, coping cap flashing and similar components. Refer to dedicated trade Sections for special finishes specified therein and their effects on your trade.
 - .2 Do not paint chrome, stainless steel, vinyl, plastic laminate and aluminum surfaces throughout unless specified otherwise.
 - .3 Do not paint internal surfaces of steel tanks and stacks.
 - .4 Do not paint sprayed fire-resistant materials.
 - .5 Do not paint equipment furnished completely prime and finish painted by manufacturer unless required to have field painting over factory finish to have one common corporate colour as identified in finish schedule.
 - .6 Do not paint over ULC, FM or other code required labels or equipment identification plates.
- .3 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Definitions:
 - .1 Exposed: This refers to items visible in completed Work. In case of closets, cabinets and drawers, it includes their interiors.
 - .2 Surface Preparation: This refers to means of cleaning or treating of surface to be painted to ensure best possible bond between surface and painting applied. Surface preparation methods include but are not limited to:
 - .1 Ensure preparation and workmanship conforms to MPI Painting Manual requirements
 - .2 Removal of surface contaminants that will affect performance of painting including but not limited to: oil, grease, salts, dust, dirt, rust, rust scale, mill scale, and old coatings where applicable.
 - .3 Removal of surface imperfections including without limitations: weld spatter, sharp edges, burrs, silvers, laminations, pits, porosities and crevices.

- .4 Preparation of surfaces to Provide anchor profile or surface profile to improve mechanical bonding of coating to prepared surface by increasing surface area.
- .2 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Division 01.

1.5 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for *Project* in accordance with requirements of Division 01. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
 - .1 Submit copy of Master Painter's Institute "Architectural Painting Specification Manual", (MPI) latest edition on site during the performance of painting work.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
- .3 Qualification Data: Submit qualification data for independent paint inspection and testing agency retained for this *Project* illustrating agency's personnel credentials and experience on *Projects* of similar size and scope.
- .4 Samples: Submit following samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate in sizes indicated.
 - .1 Brushouts: minimum 200 mm x 250 mm (8" x 10") of each colour required at least 30 Days prior to commencement of painting.
- .5 Product List: Conform to requirements of Division 01 and submit a Schedule of Finishes listing manufacturer's Product name and colour for each paint system. Upon completion, submit records of products used. List products in relation to finish systems and include the following:
 - .1 Product Name, Type and Use
 - .2 Manufacturer's Product Number
 - .3 Colour Numbers
 - .4 MPI Environmentally Friendly Classification System Rating
 - .5 VOC Level (g/L)
 - .6 Manufacturer's Material Safety Data Sheets (MSDS)

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.

- .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.
- .2 *Provide* work of this Section executed by competent installers having a minimum of 5 years' experience in application of *Products*, systems and assemblies specified and with approval and training of *Product* manufacturers.
- .3 Single Source Responsibility:
 - .1 Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.
 - .2 Provide paint and finishing materials for each procedure listed in Finish Schedule from Products of single manufacturer.
 - .3 Use single brand of paint chosen throughout work of this Section, except where specified otherwise.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Review Product literature, Material Safety Data Sheets, related safety data, proper disposal requirements and inform trades involved in work of this Section.
- .2 Deliver and store materials on site in manufacturer's sealed and labeled containers. Imprint containers with batch numbers and colour identification.
- .3 Store containers of paint, thinner and other volatile materials in well ventilated places where they will not be exposed to excessive heat or direct rays of the sun. Keep tightly closed when not in use. Remove used cloths from building at the end of every working shift and when not in use. Take precautions against spontaneous combustion by drenching with water or placing in air-tight covered metal containers.
- .4 Prevent fire or explosion caused by improper storage of paints, solvents, rags, and similar items. Store hazardous materials in location and in manner approved by local fire authority.
- .5 Post "No Smoking" signs in areas of storage and mixing. Strictly enforce this requirement. Provide and maintain CO₂ fire extinguishers of minimum 9 kg (20 lb) capacity. Repair damage to storage area or surrounding area at no cost to Owner.
- .6 Protect finished areas subject to contact during drying by posting "Wet Paint" signs and barring from traffic where necessary.
- .7 Leave storage areas clean and free from evidence of occupancy.
- .8 Collect waste paint by type and provide for delivery to recycling or collection facility. Recycle empty paint cans.

1.8 PROJECT CONDITIONS

- .1 Paint and finish work items in clean, dust-free, properly ventilated and adequately lit areas (minimum 100 lx (9.3 ft candles)).
- .2 Maintain minimum interior temperature of 18 deg C (65 deg F) during application and drying of paint and maintain until building occupancy occurs.
- .3 Do not undertake interior painting on surfaces where condensation has or will form due to presence of high humidity and lack of proper ventilation. Do not undertake painting unless substrate is a minimum of 3 deg C (5 deg F) above the dew point and rising.

- .4 Substrate Moisture Content: Perform tests with electronic moisture meter to ensure compliance with manufacturer's recommendations. Unless otherwise recommended by substrate manufacturer, maximum moisture content for following materials is as follows:
 - .1 Concrete and Concrete Unit Masonry: Maximum 12 - 14% for solvent coatings and as recommended by manufacturer for each water based system.
 - .2 Gypsum Based Board and Plaster: Maximum 12 - 14%.
 - .3 Wood: Maximum 15%.
- .5 Temperature and Ventilation:
 - .1 Do not Provide paint under ambient and surface temperatures less than 15 deg C (59 deg F) in any instance for 24 hours before and during installation; and 7 Days after installation.
 - .2 Provide ventilation to remove odours, evaporating solvents and moisture. Maintain adequate ventilation at all times to control excessive humidity.
 - .3 Ensure adequate temporary ventilation is provided under Division 01 for protection of workers from toxic fumes.

1.9 WARRANTY

- .1 Warrant Work of this Section for period of 2 years from Substantial Performance of the Work against defects and deficiencies in accordance with General Conditions of the Contract.
- .2 Promptly correct defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to: material shrinkage, cracking, splitting, bubbling, blistering and delamination resulting from defective materials or poor workmanship.

1.10 MAINTENANCE

- .1 *Supply of Touch-up Paint: Supply to Owner 1-4 litre can (1-1 gal) of each different type and colour of paint used on this Project.*
- .2 Paint shall be boxed and in sealed, unopened cans in undamaged condition, with name of manufacturer, contents, type and colour clearly indicated on a label securely adhered to can. Submit cans to Owner in accordance with requirements of Division 01.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- .1 Products of following manufacturers may be acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
 - .1 Benjamin-Moore; www.benjaminmoore.com
 - .2 PPG – PPG Paints - www.ppgpaints.com and Dulux Paints – www.dulux.ca
 - .3 Sherwin Williams; www.sherwin.com
- .2 Substitution Limitations:
 - .1 Limit material selection to Products selected from manufacturers listed herein that comply with MPI systems indicated below and listed in "MPI Approved Products List" and indicated by code numbers referred to in the Master Painter Institute Architectural Specification

Manual, latest edition. Provide listed prime and finish coat materials unless otherwise recommended in writing by the paint manufacturer for each specific substrate.

- .2 Only comparable *Products* from manufacturers listed herein will be considered provided they meet the requirements of this Specification, offering functionally, aesthetically equivalent products in Consultant's opinion and subject to Consultant's review.
- .3 Comparable Products from manufacturers listed herein offering functionally and aesthetically equivalent products in Consultant's opinion, and subject to Consultant's review, will be considered provided they meet the requirements of this Specification.

2.2 DESCRIPTION

.1 Regulatory Requirements:

- .1 Conform to *the Occupational Health and Safety Act (Ontario), Regulation 851* and other requirements of local authorities having jurisdiction for storage, mixing, application and disposal of paint and related waste materials.
- .2 For temporary scaffolding, ladders and other construction accessories, conform to *the Occupational Health and Safety Act (Ontario), Regulation 851*, and other requirements of authorities having jurisdiction, as amended.
- .3 Fire Hazard Classification: As determined by ULC testing in accordance with ASTM E84 shall not exceed following:
 - .1 Flame Spread: 0.
 - .2 Fuel Contributed: 15.
 - .3 Smoke Developed: 10.
- .4 Provide coatings from specified MPI designations which are in accordance with Canadian Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations.
- .5 Comply with toxic trace limitations stipulated by authorities having jurisdiction in accordance with requirements of CAN/CGSB-1.500.

.2 Design and Performance Requirements:

- .1 Acceptable materials, workmanship and all items affecting the Work of this Section are to be in accordance with the Master Painter's Institute "Architectural Painting Specification Manual", (MPI) latest edition, and "Maintenance and Repainting Specification Manual", latest edition. Painting work to be in accordance with MPI Premium Grade finish requirements.
- .2 Provide primers in recommended dry film thicknesses per coat (DFT/coat).
- .3 Only materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, etc.) listed in the MPI Approved Product List are acceptable for use on this Project.
- .4 Provide other materials such as linseed oil, shellac, thinners, solvents, etc. of the highest quality Product of an MPI listed manufacturer and compatible with paint materials being used as required.
- .5 Provide paint materials with good flowing and brushing properties and dry or cure free of blemishes, sags, air entrapment, and other similar effects.
- .6 Where required, ensure paints and coatings meet flame spread and smoke developed ratings designated by local Code requirements and authorities having jurisdiction.
- .7 Paint applied on materials which from time to time will become hot, such as convector covers and similar items, to be approved by paint manufacturer for particular condition.

- .8 Paint materials will be rated under Environmental Notation System (ENS) with acceptable VOC ranges as listed in the MPI Approved Product List under "E" ranges. Use only materials having a minimum MPI "Environmentally Friendly "E2" or "E3" rating based on VOC (EPA Method 24) content levels
- .9 As far as practical, factory mix paint for immediate application without thinning or alteration at site. Do not alter or thin any paint without manufacturer's written approval.
- .3 Consultant reserves right to refuse paint or finishing material if in Consultant's opinion materials are not suitable or adequate for proposed use.

2.3 MATERIALS

- .1 Topcoat and Intermediate Coat Thickness:
 - .1 Latex & Acrylics (Interior): 0.03 mm (1.2 mils) DFT/coat.
 - .2 Epoxies (Interior): 0.076 mm (3 mils) DFT/coat.
 - .3 Urethanes (Interior): 0.076 mm (3 mils) DFT/coat.
- .2 Gloss and Sheen Ratings: Gloss terms to have following values in accordance with ASTM D523 based on MPI recommended gloss reflectance guidelines:

<u>Gloss Term</u>	<u>Gloss Level</u>	<u>Gloss Value</u>
Flat or Matte	G1	0 to 5 units at 60 degrees and max 10 units at 85 degrees
Velvet	G2	0 to 10 units at 60 degrees and max 10 to 35 units at 85 degrees
Eggshell	G3	5 to 25 units at 60 degrees and 10 to 35 units at 85 degrees
Satin	G4	20 to 35 units at 60 degrees and min 35 units at 85 degrees
Semi-Gloss	G5	35 to 70 units at 60 degrees
Gloss	G6	70 to 85 units at 60 degrees

- .3 Gloss Values:
 - .1 As later selected by Consultant:
 - .1 Walls: Satin or Eggshell
 - .2 Floors: Semi-gloss

- .3 Trim and doors: Semi-gloss
- .4 Ceilings: Flat
- .4 Colours: Consultant will select colours at a later date. Refer to Interior Design Finish Schedule.
- .1 Colours of Latex Paint (PT): Maximum of 2 colours will be selected by Consultant at a later date.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Site Verification of Conditions:
 - .1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.
 - .2 Verification of Surface Conditions:
 - .1 Do work only when surfaces and conditions are satisfactory for production of quality work. Report to *Consultant* in writing any surfaces which are found to be unsatisfactory. Commencement of work implies acceptance of substrate surfaces.
 - .2 Ensure temperature of surfaces to be finished is between 10 deg C and 20 deg C (50 deg F and 68 deg F) and surfaces are dry and free of dirt, grease or other contaminants that may affect applied finish.
 - .3 Verify moisture content of surfaces with electronic moisture metre. Do not proceed without written directions if moisture reading is higher than 12 - 15%.
 - .4 Conform to manufacturer's requirements and those listed below for following substrates:
 - .1 Cast-in-place concrete substrates: Allow to cure for 60 to 90 Days before proceeding with priming.
 - .2 Concrete: Inspect and accept or reject filled-in surface blow holes.
 - .3 New masonry substrates: Allow to cure for 30 to 90 Days. Ensure moisture content is below 12% and test for alkalinity and neutralize (pH 6.5 - 7.5) before proceeding with priming.
 - .4 Gypsum board substrates: Inspect to ensure joints are completely filled and sanded smooth. Inspect surfaces for following defects and ensure corrective measures have been taken prior to commencing painting work:
 - .1 "nail popping".
 - .2 screw heads not recessed and taped.
 - .3 breaks in surface or other imperfections.

3.2 PREPARATION

- .1 Verify each substrate is dry and not frozen and free from tool and sandpaper marks, dust, rust, insects, grease and other foreign matter liable to impair finished work.
- .2 Prepare defective surfaces to obtain a satisfactory substrate and in accordance with paint manufacturer's instructions.
- .3 Prior to painting, sweep areas dust-free.
- .4 Clean soiled surfaces to be painted.
- .5 Protection:

- .1 *Provide* scaffolding, staging, platforms and ladders, as required for execution of work. Erect scaffolding to avoid interference with work of other trades. Comply with Occupational Health and Safety Act and other authorities having jurisdiction.
 - .2 *Provide* drop cloths or adequate plastic sheets to protect floors in areas assigned for storage and mixing of paints.
 - .3 Protect work of other trades against paint splattering and *Make Good* at own expense any such damage.
 - .4 Remove finish hardware, electrical switch and outlet covers, receptacle plates, fittings and fastenings, to protect from paint splatter. Mask items not removable. Use sufficient drop cloths and protective coverings for full protection of floors, furnishings, mechanical, electrical and special equipment, all other components of building which do not require painting or to be removed, from paint spotting and other soiling. Re-Install items when paint is dry. Clean any components that are paint spotted or soiled.
 - .5 Keep waste rags in covered metal drums containing water and remove from building at end of each *Day*.
 - .6 Prohibit traffic, where possible, from areas where painting is being carried out and until paint is cured. Post "wet paint" or other warning signage during and on completion of work. *Provide* also warning signs at all points of entry to areas where painting is applied.
 - .7 When handling solvent coating materials, wear approved vapour/particulate respirator as protection from vapours. Dust respirators do not *Provide* protection from vapours.
- .6 Surface Preparation:
- .1 Remove dust, grease, rust and extraneous matter from surfaces (except rust occurring on items specified to be primed under other Sections shall be removed and work reprimed under those Sections). Vacuum (fibre acoustic tile and) insulation covering surfaces. Vacuum clean floors before painting; wipe clean adjacent surfaces and surfaces to be painted before work is commenced to prevent dust and debris damage to wet paint.
 - .2 Previously Finished Surfaces:
 - .1 Clean existing interior surfaces to be repainted or varnished to provide bond. Remove rust, scale, oil, grease, mildew, chemicals and other foreign matter. Remove loose paint and fill flush with suitable patching material.
 - .2 Clean off bubbled, cracked, peeling or otherwise defective paint by stripping with suitable environmental strippers or by burning. Do not burn off paints suspected of having lead content.
 - .3 Treat residue from stripping as Hazardous Waste. Flatten gloss paint and varnish with sandpaper and wipe off dust.
 - .4 If previous coatings have failed so as to affect proper performance or appearance of coatings to be applied, remove previous coatings completely and prepare substrates properly and refinish as specified for new work.
 - .5 Leave entire surface suitable to receive designated finishes and in accordance with finish manufacturer's instructions.
 - .3 Concrete Surfaces:
 - .1 Verify moisture content is less than 12% before proceeding with painting. If concrete is less than 26 weeks old or has been previously painted, clean surface and etch with muriatic acid with extenders.
 - .2 Conform to printed instructions for handling of acidic Products and hazardous substances use following without limitations: approved gloves, aprons, boots and eye protection in accordance with the Occupational Health and Safety Act.

- .3 Do not allow muriatic acid to come in contact with steel or electronic equipment. Rinse out etching compound with clean water and tri-sodium-phosphate (TSP) to neutralize acidity of surface (pH 6.5 - 7.5). Rinse out with clean water 2 to 3 times and allow to dry. Ensure Product residue is removed prior to painting.
- .4 Concrete Floors: Prepare in accordance with paint manufacturer's recommendations. Thoroughly rinse floor with clean water. Where hardeners or other chemical curing chemicals have been used, ensure floors are dry prior to finishing.
- .5 Concrete Vertical Surfaces:
 - .1 Use sand blasting, high pressure water blasting, high pressure water blasting with abrasives, vacuum blasting with abrasives, needle guns or power grinders equipped with suitable grinding stone to remove concrete, loose mortar, fins, projections and surface contaminants.
 - .2 Vacuum or blow down and remove dust and loose particles from surface. Fill large cracks in consultation with design engineer using either polyester, epoxy or acrylic resin, block filler or cement sand mixture in accordance with design engineer's written instructions. Fill only flush to surface and allow to set.
 - .3 Concrete Block Masonry: Fill voids and cracks in masonry block wall to Provide uniform surface for subsequent coats.
- .4 Gypsum Board:
 - .1 Examine and ensure gypsum board surfaces are without defects or deficiencies and suitable to receive painting applications. Commencement implies acceptance of gypsum board work. Examine surfaces for imperfections showing through and fill small nicks or holes with patching compound and sand smooth.
 - .2 Clean surfaces dry, free of dust, dirt, powdery residue, grease, oil, wax or any other contaminants. Sand and dust as necessary prior to painting. Examine surfaces after priming for imperfections showing through.
 - .3 Ensure glass mat reinforced gypsum is prepared to receive high solid primer with minimum 40% volume solids. Ensure primer is applied with recommended roller to achieve film thickness in one coat or two coats.

3.3 MIXING

- .1 Mix and prepare paint materials in accordance with manufacturer's directions for particular material and coat to be applied. If reducing is required, do so in accordance with recommendations of manufacturer for particular material and coat.
- .2 Mix primer-sealer with a certain amount of colour coat in proportions recommended by manufacturer of material actually used. Tint undercoats and each finish coat with correct type colours, for identification of each succeeding coat.
- .3 Clean containers used for storage, mixing and application of materials free of foreign materials and residue.

3.4 APPLICATION

- .1 Paint interior exposed elements as noted on Room Finish Schedule and as required to complete design requirements. Do not paint excluded components indicated herein. Where an item or surface is not specifically mentioned in Schedules, Provide same finish as similar adjacent materials or surfaces. If color or finish is not designated, Consultant will select from standard colors or finishes available.
- .2 *Provide* finish uniform in sheen, colour and texture, free from streaks, shiners and brush or roller marks or other defects.

- .3 Apply materials in accordance with manufacturer's directions and *Specifications* paying particular attention to appropriate time frame after cleaning when environmental conditions encourage flash-rusting, rusting, contamination or manufacturer's paint *Specifications* require earlier applications. Apply subsequent coatings in accordance with manufacturer's recommended recoat "windows". Do not use adulterants. Do any reduction of coating's viscosity in accordance with manufacturer's directions.
- .4 Use up paints within the period of shelf life recommended by paint manufacturer.
- .5 Successive coatings to be harmonious chemical compositions and materials of same manufacturer.
- .6 Thoroughly mix materials before application. Apply materials evenly, under adequate illumination, free from sags, runs and other defects. Do cutting-in neatly and ensure paint is applied wet edge to wet edge.
- .7 Sand and dust between each coat to *Provide* an anchor for next coat and to remove defects visible from a distance up to 1000 mm (39").
- .8 Ensure each coat is dry and hard as per manufacturers' recommendations for recoats before a following coat is applied.
- .9 Continue through paint finish behind wall-mounted items (e.g. markerboards and tack boards).
- .10 Finishes and number of coats specified hereinafter in Finish Schedule are intended as minimum requirements guide only. Refer to manufacturer's recommendations for exact instructions for thickness of coating to obtain optimum coverage and appearance. Some materials and colours may require additional coats and deeper colours may require use of manufacturers' special tinted primers.
- .11 Apply additional paint coats, beyond number of coats specified for any surface, to completely cover and hide substrate and to produce a solid, uniform appearance.
- .12 Allow each coat of paint to cure and become dry and hard before application of succeeding coats (unless manufacturer's directions require otherwise).
- .13 Before finishing paint coats are applied, inspect and touch-up shop coats of primers previously applied by other trades or fabricators.
- .14 *Provide* paint coating thicknesses indicated, measured as minimum dry film thicknesses.
- .15 Obtain colour chart giving colour schemes and gloss value for various areas from *Consultant*. Colour chart shall give final selection of colours and surface textures of finishes and whether finishes are transparent (natural) or opaque (paint).
- .16 Spraying is not allowed without written permission.
- .17 Paint entire plane of areas exhibiting incomplete or unsatisfactory coverage and of areas which have been cut and patched. Patched appearance is not acceptable.
- .18 Finish paint factory primed surfaces. Do not paint baked paint surface, chrome plated, stainless steel, aluminum or other surfaces finished with final finish in factory.
- .19 Advise *Consultant* when each applied paint coat can be inspected. Do not recoat without inspection. Tint each coat slightly to differentiate between applied coats.
- .20 Apply final coats on smooth surfaces by roller or brush. Hand brush wood trim surfaces.
- .21 Sand smooth paint and varnish undercoats prior to recoating.
- .22 Apply primer coat soon after surface preparation is completed to prevent contamination of substrate.
- .23 Woodwork:

- .1 Prime woodwork designated for painting as soon as possible after delivery to site and before installation. Prime cut surfaces, whether exposed or not (i.e. all 6 edges of wood doors) before installation. Prime cut surfaces of woodwork to receive transparent finish with 1 coat of transparent finish reduced 25%.
 - .2 Fill open grain woods with filler tinted to match wood and work well into grain. Wipe excess from surface before filler sets.
 - .3 Apply primer-sealer coats by brush or roller. Permit to dry in accordance with manufacturer's recommendations before applying succeeding coats. Touch up suction spots and sand between coats with No. 120 sandpaper.
 - .4 Apply final coats on smooth surfaces by roller or brush. Hand brush wood trim surfaces.
- .24 Ferrous Metal Surfaces: Apply primer coat to unprimed ferrous metal surfaces. Where sandblast preparation is specified, apply specified primer immediately after blast cleaning.

3.5 EXISTING SPACES

- .1 Refinish existing surfaces of rooms or areas which have been damaged, altered or otherwise affected by work. Also finish "new" work occurring thereon unless otherwise specified. Use same procedure as for new work but primer (or filler, stain and sealer in case of varnish finish) may be omitted. Prepare existing surfaces as specified herein. Ensure finish matches previous finish.
- .2 Paint or repaint rooms or areas where noted on Room Finish Schedule and/or as indicated on *Drawings*.
- .3 Repaint surfaces entirely between changes of plane.
- .4 Extend painting to a suitable boundary to avoid a "patched" effect. Sand, wire-brush, or scrape such existing finished surfaces to remove loose paint and to reduce gloss. Also clean existing films of dirt, grease or wax. If metallic surfaces are rusted, remove loose scale to *Provide* a firm surface. Patch and sand cracks and other imperfections.
- .5 *Provide* paint to interior existing spaces effected by alterations [and shelled-in spaces] in accordance with following:
 - .1 Paint walls to the nearest inside and outside corners for the full wall height.
 - .2 Paint columns floor to ceiling.
 - .3 Paint full ceilings to the nearest wall or bulkhead.
 - .4 Unless indicated otherwise match the existing colour.
 - .5 Where Room Finish Schedule indicates existing and/or new wall finishes to be painted, existing surfaces such as, existing door and frames, mechanical *Supply* and return air grilles (both on walls and ceilings), access doors and electrical panels which has been previously painted shall be painted for a complete finish room. If the Room Finish Schedule indicates "-" it denotes the entire room need not be painted, only the patched area to be painted.
- .6 Example Locations:
 - .1 pressed steel frames.
 - .2 hollow metal doors.
 - .3 access doors and frames.
 - .4 hose cabinets.
 - .5 miscellaneous exposed interior metal work.

3.6 MECHANICAL AND ELECTRICAL SERVICES

- .1 Read Division 21, 22, 23 and Division 26 for their requirements and further instruction on painting Mechanical and Electrical work and perform such work under supervision of respective Mechanical and Electrical Divisions.
- .2 Finish paint primed mechanical equipment: heaters, convectors, radiators, wall fin perimeter induction units, fan coil units and similar items.
- .3 Prime and paint exposed, unfinished electrical raceways, fittings, outlet boxes, junction boxes, pull boxes and similar items.
- .4 Keep sprinkler heads free of paint.
- .5 Take steps to protect gauges, identification plates and similar items from being painted over or paint splattered.
- .6 Remove grilles, covers, access panels for mechanical and electrical systems from installed location and paint separately, if these items are not factory finished
- .7 Paint work to match surfaces they are seen against unless directed otherwise.
- .8 Paint interior surfaces of air ducts visible through grilles and louvres, with 1 coat of flat black metal paint to limit of sight line.

3.7 CLEANING

- .1 Clean adjacent surfaces which have been painted, soiled or otherwise marred.
- .2 Remove masking and other protection provided under this Section.
- .3 During work of this Section cover finished floors, walls, ceilings and other work in vicinity and protect from paint and damage.
- .4 Painting work will not be considered complete until spatters, drippings, smears and overspray have been cleaned and removed to satisfaction of *Consultant*.
- .5 *Make Good* any damage to structure building surfaces or furnishings resulting from painting operations at no cost to *Owner*.
- .6 Disposal of Paint Waste:
 - .1 Be responsible for removal and disposal of material and waste generated by this Section.
 - .2 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.) are regarded as hazardous *Products* and are subject to regulations for disposal. Obtain information on these controls from applicable Provincial government departments having jurisdiction.
 - .3 Separate and recycle waste materials. Where paint recycling is available, collect waste paint by type and *Provide* for delivery to recycling or collection facility. Materials that cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
 - .4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
 - .5 To reduce amount of contaminants entering waterways, sanitary/storm drain systems or into the ground adhere to following procedures:
 - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out. In no case clean equipment using free draining water.
 - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

- .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
 - .4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.
 - .5 Dry empty paint cans prior to disposal or recycling (where available).
 - .6 Close and seal tightly partly used cans of materials including sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.
- .6 Set aside and protect surplus and uncontaminated finish materials not required by *Owner* and deliver or arrange collection for verifiable re-use or re-manufacturing.

3.8 INTERIOR PAINT FINISH SCHEDULE

.1 Low Odour/Low VOC Interior, Interior Finishes (PT)

.1 Gypsum Board Substrates:

- .1 Regular Gypsum Board: Institutional Low-Odor/VOC Latex System (INT 9.2M as amended):
 - .1 Prime Coat: One coat Primer sealer, interior, institutional low odor/VOC (MPI #149).
 - .1 "ProMar 200 Zero VOC Interior Latex Primer, 0 g/L" by Sherwin Williams
 - .2 "Pure Performance Interior Latex Primer 9-900" by PPG Architectural
 - .3 "K534 Ultra Spec 500 Waterborne Interior Primer Sealer" by Benjamin Moore
 - .4 "Ultra Zero VOC Interior Primer/ Sealer" by PPG Architectural- Dulux Paints
 - .2 Topcoats: two coats, latex, interior, institutional low odor/VOC, (MPI #143, MPI #144, #145)
 - .1 "ProMar 200 Zero VOC, 0 g/L" by Sherwin Williams
 - .2 "Pure Performance Interior Latex Zero VOC 9-line" by PPG Architectural
 - .3 "Ultra Spec 500 Interior Finish, 0g/L" by Benjamin Moore
 - .4 "Ultra Zero VOC" by Dulux Paints
- .2 Fiberglass-Mat Faced Gypsum Board Walls (Moisture resistant gypsum board, abuse resistant gypsum board, impact resistant gypsum board)
 - .1 Primer: One coat high build surfacer (Minimum DFT: as recommended by manufacturer but not less than 10 mils)
 - .1 "Builders Solution, <50 g/L" by Sherwin Williams
 - .2 "Speedhide Maxbuild High Build Drywall Surfacers" by PPG Architectural
 - .3 "X-pert High Build Primer/Sealer 11020A" by Dulux Paints
 - .2 Sealing Coat: One coat multi-purpose latex interior primer sealer (MPI #39) as recommended by manufacturer:
 - .1 "Prep Rite Pro Block Primer-Sealer, 0 g/L" by Sherwin Williams
 - .2 "Insl-X Prime All Multi-Surface Latex Primer Sealer" by Benjamin Moore
 - .3 "Seal Grip Interior/Exterior Acrylic Universal Primer/Sealer" by PPG Architectural.
 - .3 Topcoats: two coats, latex, interior, institutional low odor/VOC, (MPI #143, MPI #144, #145)

- .1 "ProMar 200 Zero VOC, 0 g/L" by Sherwin Williams
 - .2 "Pure Performance Interior Latex Zero VOC 9-line" by PPG Architectural
 - .3 "Ultra Spec 500 Interior Finish, 0g/L" by Benjamin Moore
 - .4 "Ultra Zero VOC" by Dulux Paints
- .2 Steel Substrates (Non-galvanized):
- .1 Doors, Frames and Miscellaneous Metals - Water-Based Light Industrial Coating System (INT 5.1B as amended)
 - .1 Prime Coat: One coat Primer, rust-inhibitive, water based (MPI #107).
 - .1 "Pro Industrial Pro-Cryl Universal Primer, <50 g/L" by Sherwin Williams
 - .2 "Pitt-Tech Plus DTM Acrylic Primer" by PPG Architectural
 - .3 "Ultra Spec HP D.T.M. Primer FP04" by Benjamin Moore
 - .2 Topcoats: two coats, Light industrial coating, interior, water based (MPI #151):
 - .1 "Pre-catalyzed Waterbased epoxy, <50 g/L" by Sherwin Williams
 - .2 "Corotech Pre-Catalyzed Waterborne Epoxy" by Benjamin Moore
 - .3 "Pitt-Glaze WB Pre-Catalyzed WB Acrylic Epoxy" by PPG Architectural
- .3 Galvanized-Metal Substrates:
- .1 Doors, Frames and Miscellaneous Metals - Water-Based Light Industrial Coating System (INT 5.1B as amended)
 - .1 Prime Coat: One coat Primer, rust-inhibitive, water based (MPI #107).
 - .1 "Pro Industrial Pro-Cryl Universal Primer, <50 g/L" by Sherwin Williams
 - .2 "Pitt-Tech Plus DTM Acrylic Primer" by PPG Architectural
 - .3 "Ultra Spec HP D.T.M. Primer FP04" by Benjamin Moore
 - .2 Topcoats: two coats, Light industrial coating, interior, water based (MPI #151):
 - .1 "Pre-catalyzed Waterbased epoxy, <50 g/L" by Sherwin Williams
 - .2 "Corotech Pre-Catalyzed Waterborne Epoxy" by Benjamin Moore
 - .3 "Pitt-Glaze WB Pre-Catalyzed WB Acrylic Epoxy" by PPG Architectural
- .4 **Miscellaneous General Areas**
- .1 Substrate: Non-insulated Pipes, Ducts, Conduit, Valves, Fittings and Equipment and Ancillary Items where "Exposed" in Completed Work
 - .1 Primer: As recommended by manufacturer for specific substrate.
 - .2 Top Coats: 2 coats latex coating (MPI #53)
 - .1 "ProMar 200 Zero VOC, 0 g/L" by Sherwin Williams
 - .2 "Speedhide PRO-EV Zero Interior Latex (12-110XIC) PPG Paint or Ultra Zero VOC Interior Latex (97500) Dulux Paint by PPG
 - .3 "K536 Ultra Spec 500 Waterborne Interior Finish" by Benjamin Moore
 - .2 Substrate: Canvas and Cotton Coverings (Pipe and Duct Coverings, etc.) – Institutional Low Odor/Low VOC (INT 10.1D as amended)
 - .1 Primer: 1 coat multi-purpose latex interior primer sealer (MPI #50)
 - .1 "ProMar 200 Zero VOC Interior Latex Primer, 0 g/L" by Sherwin Williams
 - .2 Pure Performance Interior Latex Primer (9-900C) " – PPG Paint or Ultra Zero VOC Interior Latex Primer (97600) – Dulux Paint by PPG
 - .3 "K534 Ultra Spec 500 Waterborne Interior Primer Sealer" by Benjamin Moore

- .2 Top Coats: 2 coats latex Interior, Institutional Low Odor/VOC (MPI #143, MPI #144, #145)
 - .1 Zero VOC Latex Paint:
 - .1 "ProMar 200 Zero VOC, 0 g/L" by Sherwin Williams
 - .2 Pure Performance Interior Latex Zero VOC 9-line" – PPG Paint or Ultra Zero VOC Interior Latex (97XXX Series) – Dulux Paint by PPG
 - .3 "K536 Ultra Spec 500 Interior Finish" by Benjamin Moore
 - .2 Zero VOC and Silica-free Latex Paint:
 - .1 "Harmony Interior Latex — Odor Eliminating Technology, 0 g/L" by Sherwin Williams
 - .2 "K536 Ultra Spec 500 Interior Finish" by Benjamin Moore
 - .3 Pure Performance Interior Latex Zero VOC 9-line" – PPG Paint or Ultra Zero VOC Interior Latex (97XXX Series) – Dulux Paint by PPG

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 Work Included: *Provide* accessories including but not limited to following:
 - .1 Soap Dispenser (SD)
 - .2 Paper Towel Dispenser Units (PTD)
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Division 01.

1.5 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for *Project* in accordance with requirements of Division 01. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials. As a minimum indicate the following:
 - .1 Construction details and dimensions.
 - .2 Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - .3 Material and finish descriptions.
 - .4 Features that will be included for Project.
 - .5 Manufacturer's warranty.

- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
- .3 Maintenance Instructions: Submit maintenance instructions in accordance with Division 01. Submit an accessories schedule, keys and parts manual as part of Project closeout documents. Submit 2 sets of following items of manufacturer's literature:
 - .1 Technical Data Sheets of each item used for the *Project*.
 - .2 Service and Parts Manuals.
 - .3 Name of local representative to be contacted in the event of need of field service of consultation

1.6 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
 - .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.
- .2 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in sealed cartons and containers with manufacturer's name and *Product* description clearly marked thereon.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- .1 Regulatory Requirements:
 - .1 Install systems in accordance with Ontario Building Code regulations concerning access of physically challenged and disabled persons and requirements of CAN/CSA B651 and any other requirements from authorities having jurisdiction.
- .2 Design and Performance Requirements:
 - .1 Provide accessories as specified with options indicated. Model numbers may not reflect all options required.
 - .2 Provide stainless steel collars to accommodate semi-recessed mounting of units whose depth exceeds wall cavity depth.
 - .3 Edges of sheet metal which are accessible to users or maintenance personnel shall be pneumatically sanded to yield smooth safe edges with no sharpness.
 - .4 Mount items with concealed fasteners unless otherwise indicated or unavoidable. Where exposed fasteners are unavoidable, use tamper-resistant types.

- .5 Concealed Steel Reinforcing: Provide concealed sheet steel reinforcing to support all wall-mounted accessories. Coordinate with Section 09 21 16.

2.2 MATERIALS

- .1 Ensure accessories are stainless steel conforming to ASTM A167, Type 304 or Type 302, of 1 type throughout, ANSI No. 4 mechanical brushed finish, of contemporary design, with minimum material thicknesses of components as specified herein. Arrange stainless steel sheet so grain of brushed finish runs vertically in finished installation.
 - .1 Minimum thickness, any location or component: 0.645 mm
 - .2 Hygienic accessory - exposed double pan doors and panels: 0.645 mm
 - .3 Hygienic accessory - exposed single pan doors: 1.26 mm
 - .4 Reinforcement: 1.26 mm

2.3 MANUFACTURED UNITS

- .1 Soap Dispenser – Wall mounted, vertical (SD)
 - .1 Soap type: liquid or lotion form.
 - .2 Acceptable *Products*:
 - .1 Model No. 0-347 by ASI Group Canada
 - .2 Model No. B-2111 by Bobrick Washroom Equipment
 - .3 Model No. 6562 by Bradley
- .2 Paper Towel Dispenser Units – Surface-mounted (PTD): Type 304 stainless steel, no. 4 finish, unit for dispensing preset length of roll paper towels.
 - .1 Minimum Towel-Dispenser Capacity: 400 C-fold or 500 multifold towels.
 - .2 Acceptable *Products*:
 - .1 Model No. 0210 by ASI Group Canada
 - .2 Model No. B-262 with TowelMate No. 262-130 by Bobrick Washroom Equipment
 - .3 Model No. 250-15 by Bradley

2.4 FABRICATION

- .1 Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- .2 Use non-corrosive metal fasteners of expansion type, toggle type or other approved type of positive, mechanical anchor as required to suit construction to which accessory is to be mounted. Exposed fasteners, where permitted, shall be finished to match adjacent accessory surface, and be countersunk.
- .3 Where accessories are mounted to sheet metal, *Provide* a minimum 3 mm (1/8") thick full-size metal back-up plate drilled and tapped to receive machine screws and finished to match adjacent sheet metal surface.
- .4 Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide keys to Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Site Verification of Conditions:
 - .1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

3.2 INSTALLATION

- .1 Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer.
- .2 Verify wall opening for correct dimensions, plumbness of blocking or frames and other preparation that would affect installation of accessories. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- .3 Securely fasten accessories, level and plumb using appropriate fastenings as recommended by manufacturer. Fit flanges of accessories snug to wall surfaces.
- .4 *Provide* corrosion resistant fastenings. Where fasteners are exposed, use tamper-proof fasteners finished to match items secured.
- .5 Locate accessories where indicated on *Drawings* and where directed by *Consultant*. Obtain *Consultant's* acceptance of exact locations.

3.3 ADJUSTING, CLEANING AND POLISHING

- .1 Remove protective coatings and paper including adhesives.
- .2 Test mechanisms, hinges, locks and latches.
- .3 Adjust and lubricate to ensure accessories are in perfect working order.
- .4 Clean and polish mirrors, aluminum and stainless steel surfaces.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

- .1 Read and conform to:
 - .1 The Contract CCDC 2-2008, Stipulated Price Contract, including General and Supplementary Conditions as amended in the Contract Documents.
 - .2 Division 01 requirements and any additional documents referred to therein.

1.2 SUMMARY

- .1 *Work Included: Provide* food service equipment including but not limited to following:
 - .1 food service equipment ready for final connection of services by mechanical and electrical trades.
 - .2 caulking and sealing of equipment to walls, curbs, bases, adjacent units and between any dissimilar materials.
 - .3 securing of all permanent equipment to floor or base. Use stainless steel shims for leveling.
 - .4 stainless steel strips and filler pieces necessary to properly finish any individual or combined set of pieces of equipment as part of this Section.
 - .5 protection, identification and recessing of all controls, pilot lights, switches and valves on any item of equipment.
 - .6 necessary access panels within each piece of equipment to allow for proper maintenance and service. Allow access when 2 or more units are adjacent to each other.
 - .7 *Supply* of all standard equipment accessories normally furnished with all items specified whether indicated or not.
 - .8 all inserts, bolts, anchors, sleeves, ferrules and other assorted hardware as may be necessary for the proper anchorage, fixing or attachment of equipment to the building.
 - .9 verification of the dimensions and services of all pieces of equipment that may be supplied by other parties but are to become a part of a unit specified under this work in order to ensure a proper fit and coordinated installation.
 - .10 Auxiliary materials required for a complete installation.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

1.3 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of Bid Closing Deadline of the Project, including any amendments adopted, are applicable unless otherwise indicated.

1.4 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's literature, data sheets for each type of material provided under this Section for *Project*. Data sheets shall provide all required information. Submit 3 copies of

- detailed instructions for maintaining, preserving and keeping materials in clean and safe conditions and give adequate warning of maintenance practices or materials detrimental to specified materials. Submit manufacturer's installation instructions.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Division 01, for adhesives, sealants and any other material designated by Consultant.
 - .3 Manufactured items being purchased by this Section must be illustrated by catalogue cuts and data sheets. Submit illustration/cuts bound in booklet form for review. Sheets are to be in numerical order, properly labeled with the name of *Project* and accompanied by a lead sheet with an itemized list of contents.
 - .4 Ensure equipment suits the space allocations and the intent of the design.
 - .5 After illustrations have been reviewed, *Provide* the required number of sets for distribution.
- .2 Shop Drawings:
- .1 Submit *Shop Drawings* in accordance with Division 01 for fabricated items and assemblies of equipment with a detailed description, clearly indicated methods of construction, gauges, assembly, fastenings, services, etc.
 - .2 *Drawings* prepared by *Consultant* depict equipment design and details. It is the responsibility of this *Subcontractor* to prepare *Shop Drawings* in conjunction with *Consultant's Drawings, Specifications, mechanical and electrical data, details and other information. Co-ordinate Drawings with Architectural and Engineering plans, as built site conditions and the work of all relevant Sections.*
 - .3 Identify and explain any variation in the *Shop Drawings* which do not adhere to the original *Specifications* or details. Advise *Consultant* in writing of any conditions that would limit or adversely effect the design intent.
 - .4 Ensure component parts and assemblies of each piece of equipment will support the loads anticipated without deflection detrimental to function, safety or appearance.
 - .5 Prepare fully dimensioned "Roughing-In" and final connection point drawings for mechanical and electrical services. Separate mechanical and electrical, or combined drawings, may be submitted. Include walk-in and fire suppression schematics and any pertinent installation diagrams including dimensioned "sleeving" drawing.
 - .6 If "Rough-in" drawings have already been prepared by *Consultant*, it is responsibility of this *Subcontractor* to check and verify drawings and advise *Consultant* of any discrepancies.
 - .7 Verify power and location requirements for any piece of equipment that is being supplied by *Owner* or is existing and being reused. Incorporate this information into the *Shop Drawings* "Rough-in" and connection point drawings.
 - .8 Submit equipment data sheets and *Shop Drawings* in following order:
 - .1 Catalogue cuts and illustrations.
 - .2 Plan lay out drawing with mechanical and electrical "roughing-ins" and "connection points".
 - .3 "Sleeving" drawing.
 - .4 Base, curb and depressions.
 - .5 Custom fabricated items.
 - .9 Review of *Shop Drawings* is general and applies to design only, it is not intended to serve as a final check and shall not relieve this contractor of the responsibility for errors in dimensions, quantity, material or interfacing as required to complete the intent of the design.

- .10 Shop drawing submissions shall be checked and signed by a senior member of the firm qualified to evaluate the function and construction necessary.
- .11 Examine *Drawings* and *Specification* of all Sections for any information that may affect this work and co-ordinate the architectural and service requirements with other appropriate contractors.
- .3 Samples:
 - .1 If requested by *Consultant*, submit a sample of components or fabrication method, material or finish, for review and approval before proceeding with that aspect of the work. Where necessary, request a shop inspection of an assembly which cannot be submitted for approval. Include in the base bid price, the cost of samples which may be rejected.
 - .2 Samples must be the precise articles proposed to be supplied.
 - .3 Samples must be supplied in required quantity and all except 1 will be returned.
 - .4 Reviewed samples will become the standard of workmanship and material against which installed work will be checked.
 - .5 Obtain from *Owner* all necessary samples of china, baskets, trays, etc. to determine proper sizes for openings, angle slides dispensers, conveyor, etc.
 - .6 Prior to ordering dishwashing or tray washing equipment, obtain from *Owner* a sample of all wares and assure their compatibility with ware washing equipment.

1.5 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
 - .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.
- .2 If *Contractor* is an equipment dealer only, they shall at the time of bidding, in writing provide the name, address and qualifications of the fabricator proposed for the manufacturing and installation of custom stainless steel equipment. All equipment and components supplied from manufacturers shall be the latest model or issue and shall be new and unused in every respect.
- .3 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.
- .4 Regulatory Requirements:
 - .1 All electrical equipment must conform to the Canadian Hydro Electrical Code, the Electrical Inspection Department Bulletins, the Ontario Hydro Electric Safety Code and the Canadian Standards Association. All equipment must have a CSA approval label. Equipment that is not CSA approved will be rejected, removed from the site and substituted for at no additional cost to the *Contract*.
 - .2 Gas equipment shall conform to the Canadian Gas Association, the Gas Utilization Code of the Department of Energy and Resources Management, Ontario and Canadian Standard Association.
 - .3 Any plumbing or drainage systems shall conform to the Plumbing Code and Ontario Water Resources Act except as modified by regulations and bylaws of authorities having jurisdiction.

- .4 Steam equipment shall conform to interprovincial codes covering such equipment as well as the rules, regulations and by-laws of authorities having jurisdiction.
- .5 Each piece of equipment shall be accompanied by a label or certificate of approval.
- .6 Equipment design and fabrication must conform with the National Sanitation Foundation and Provincial as well as Local Municipal Health Department Regulations.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Co-ordinate deliveries of equipment in conjunction with construction activity and progress at the site and as dictated by the *Owner* and the *General Contractor*.
- .2 Deliver, unpack and set in place all equipment in the designated position, ready for final connection of services, for units with electrical or mechanical connections.
- .3 *Supply* to *Owner* and *General Contractor*, in sufficient time, any information or items of service, articles, components or equipment which requires building in or which may overlap or impede the work of others.
- .4 *Provide* all necessary information within adequate time and in proper sequence regarding the exact location of openings, chases and any attachments or other fittings required for foodservice equipment.
- .5 *Supply* and deliver to site in sufficient time all inserts, anchors, bolts, sleeves, ferrules and similar items for attaching to, or building into, masonry, concrete and other work for the proper anchorage and fixing of the equipment. Include necessary templates, instructions, directions and/or assistance in the location and installation of all items by other contractors.
- .6 Manufacturers name or recognized trademark:
 - .1 Complete model identification.
 - .2 Model, serial number and CSA.
 - .3 Electrical characteristics.
 - .4 Direction of drive.
 - .5 Controls.
 - .6 Circuits, lines, etc.
 - .7 Specific operating instructions.
- .7 Identify equipment with temporary labels showing location and Item number per *Specifications*.
- .8 After installation has been completed and all items checked and adjusted where necessary for satisfactory operation, arrange for inspection of equipment. If items are found unsatisfactory, make necessary corrections and adjustments.

1.7 MAINTENANCE

- .1 Maintenance Manuals:
 - .1 *Supply* 4 sets of manuals, bound and labeled, incorporating operating and maintenance instructions, including spare parts list and optional accessories for all items specified.
 - .2 Identify each item, arrange in proper sequence and ensure numbers correspond to *Specifications* and *Drawings*.
 - .3 *Provide* an itemized lead sheet at the front of the manual with a list of the contents and the name and phone number of the service company.

1.8 WARRANTY

- .1 Warrant work of this Section for period of 5 years from Substantial Performance of the Work against defects and/or deficiencies in accordance with General Conditions of the *Contract*. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of *Consultant* and at no expense to *Owner*.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE REQUIREMENTS

- .1 All equipment supplied under this *Contract* shall be made of the best grade materials and with first class workmanship and shall be in accordance with the *Drawings* and *Specifications*.
- .2 Unless otherwise specified in the Itemized List of Equipment, fabricated equipment referred to as "stainless steel" shall incorporate the materials listed herein wherever necessary.

2.2 MATERIALS

- .1 Stainless Steel:
 - .1 *Supply* stainless steel in accordance with ASTM A167 (18-8 Analysis) type 304, No. 4 finish 1 side, 180 grit finish free of buckles, pits, warps and imperfections. Ensure direction of grain matches throughout units.
 - .2 Stainless steel tubing shall be 304, seamless and welded, No. 4 finish, 38 mm (1-1/2") square for legs and bracing.
 - .3 Nuts, bolts, screws, washers and other fastenings shall be type 304 stainless steel.
- .2 Galvanized steel sheet, generally referred to as Satincoat; zinc coated, 380 gms/m². Where such material is used as an exposed surface, it shall be finished with 1 coat of primer and 2 coats of air dry enamel, silver gray unless otherwise specified.
- .3 Structural steel shall be new material, conforming to recognized standards, grade 300W, cleaned and primed.
- .4 Gauges of material refer to U.S. Standard Gauges.
- .5 Plywood to be Douglas Fir, minimum 5 ply construction conforming to CSA O121-M, good 2 sides, waterproof where required.
- .6 Laminated plastic sheet and decorative materials used to clad surfaces of wood or metal shall be Arborite, Formica or Nevamar, 1.0 mm thick or such other materials as may be specified or indicated on the *Drawings*. Where plywood or wood particle board panels are being clad, apply laminate manufacturer's backing sheet wherever necessary to obtain a balanced construction and prevent warpage. All panels shall be 19 mm thick before plastic laminate is applied. Finish all exposed edges.
- .7 Sound deadening, 3 mm (1/8") thick rigid waterproof insulation, Component Hardware M75-1366 applied under working surfaces.
- .8 Gauges are as follows:
 - .1 1.0 mm -20 ga.
 - .2 1.2 mm -18 ga, 1.6 mm -16 ga, 2.0 mm -14 ga, 3.0 mm - 12 ga.
- .9 Electrical Components:

- .1 Electrical parts supplied under this Section shall be compatible with materials specified for use on this *Project*. Refer to Division 26. Receptacles shall have stainless steel cover plates and screws. Cords and caps shall be approved type, matching the receptacles for which they are intended.
 - .2 Make receptacles, junction boxes and breaker panels easily accessible without dismantling equipment.
 - .3 Terminate wiring within equipment at load Centre or junction boxes with wires identified by Item No. and load.
 - .4 Properly rate and ground all receptacles.
 - .5 *Provide* all lighting fixtures for designated equipment with colour corrected lamps and controls or switches wired to an easily accessible common junction box for power connection.
 - .6 Fit all portable and mobile electrical equipment with cord and plug suited for the electrical characteristics and outlets specified for the equipment. Include grounding conductor in the cord.
- .10 Plumbing Components:
- .1 Plumbing components supplied under this section shall be compatible with materials specified for use on this *Project*. Refer to Divisions 21, 22 and 23 Mechanical
 - .2 All control valves and faucets, pipe fittings, waste and tail pieces etc., must be brass chrome plated, bright finish, new, best quality and comply with applicable codes.
 - .3 Valve handles must be of non-conductive materials.
- .11 Miscellaneous:
- .1 Casters to be Darnell, Colson, Kilian or Flex-elle black neoprene non marking rubber tired, 60 shore hardness, doughnut shaped, ball bearing, equipped with brakes as noted, sized to suit specific usage, zinc finished. Plate type shall be securely bolted to frame. Shank casters shall be threaded type c/w bushing. Bushing shall be welded and upright. Bolts, nuts and lock washers shall be stainless steel All casters supplied shall be made by the same manufacturer. Casters shall be supplied on each unit to suit its particular application so that it runs freely and handles easily, minimum of 100 mm (4") diameter and 200 lbs. capacity per caster.
 - .2 Bumpers shall be Colson #6915 for wrap around type set into stainless steel channel and #6927 for corner type CAN a 1.6 mm stainless steel exterior casing. Secure bumpers on equipment at identical height and seal any exposed gap.
 - .3 Garbage containers shall be yellow Rubbermaid #2620 complete with lid and #2623 Dolly.
 - .4 Towel rack shall be K-Venience type.
 - .5 Cutting boards shall be white thermoplastic polyethylene, with a hardness of 65-70 durometer and all surfaces polished, as supplied by Rubbermaid Products Inc., Johnson Plastics or approved equal.
 - .6 Sealant to be Dow'Silastic' or CGE #SCS-1600 clear or as required to suit colour of surrounding materials.
- .12 Hardware:
- .1 Handles that are an integral part of doors shall be Klein #1263 full grip stainless steel pulls.
 - .2 Handles that are an integral part of drawers shall be Klein #1263 full grip stainless steel pulls.

- .3 Catches shall be Klein #2932, concealed magnetic catch with a 30 lb. pull.
- .4 Track hardware shall be Sterling No. 602 or Klein 1350 series.
- .5 Door guides shall be Sterling No. 876 or equal.
- .6 Door stops shall be Sterling No. 880 or equal.
- .7 By-passing door locks shall be Klein 1230 series.
- .8 Swing door hinge shall be all welded stainless steel continuous piano type hinge; for refrigerator doors, use Klein 7820 series chrome plated edgemount hinges.
- .9 Refrigerator door hardware: Self closing, heavy duty stainless steel offset pivot hinges with magnetic gaskets and 430 stainless steel door frame and tamper proof cylinder locks and 2 keys per lock.
- .10 Drawer slides: Klein 1410 series for standard units and 1452-3026-1251 for refrigerated units.
- .11 Drawer locks: Klein 1211 series, stainless steel (drawers shall not be keyed alike). *Supply* 2 keys per lock and hand over to *Consultant*.
- .12 *Provide* locks on all doors and drawers. Key each section of the foodservices areas with a different series of locks, [2] keys per lock.
- .13 Pilaster strips, stainless steel 20 mm wide with 13 mm adjustment.
- .14 Clips for shelves shall be stainless steel.

2.3 COMPONENTS

- .1 Worktables & Counters:
 - .1 2.0 mm stainless steel continuous sheets all welded.
 - .2 Reinforcing shall be a minimum 3.0 mm stainless steel 100 mm x 25 mm "top hat" type channel, arranged so that forms are concealed from normal view. Secure reinforcing to tops with stud welding and appropriate silicone.
 - .3 Table or counters up to 1800 mm in length shall have a minimum of 4 legs.
 - .4 Tables with sinks shall have a marine edge unless otherwise specified.
 - .5 Edges shall be as shown and specified in the standard detail.
- .2 Tops:
 - .1 Stainless steel tops as specified under "Worktables and Counters".
 - .2 Wood tops as manufactured by Michigan Maple Ltd. style "G" - 48 mm thick, cured and selected edge grain laminations c/w steel bolt reinforcements. Sand and finish both sides. Polyethylene tops (high density types) as distributed by Johnson Plastics. Material is white (all surfaces polished with a hardness of 65 A 70 durometer), 19 mm (3/4") thick, no-toxic, with no odour or taste transfer and stain resistant. Top to be reversible and properly supported on stainless steel framework.
 - .3 Marble tops shall be continuous 25 mm (1") thick, white veined and fairly uniform in colour. *Provide* "A" type graded marble free of cracks and fractures. Support top on stainless steel framework with lateral cross members and a rubber cushioned underpad at the supports. Polish and seal to protect against acids and oils.
- .3 Backsplash:
 - .1 2.0 mm stainless steel fully welded. See Standard Detail Sheet D1 and D2.

- .2 Integral section of table or counter top turned up on a 19 mm (3/4") radius to the height specked, then boxed or splayed. Refer to standard detail.
- .3 Enclose, fill and weld all exposed ends and back. Exposed backs at upturns and splashbacks shall be faced with 1.2mm stainless steel back panel to bottom of splashback. Such panels shall be removable as required for access to mechanical and electrical parts. Seal backs to wall with clear silicone.
- .4 Legs And Bracing:
 - .1 1.6 mm stainless steel wall, 38 mm (1-1/2") square.
 - .2 *Provide* framework for table tops to maintain a height of 900 mm above finished floor.
 - .3 Bullet feet, Standard Keil 1014-0601-1144. Dowel and secure to floor when unit has service connections. Secure to one set of feet only when bridging a structural expansion joint.
 - .4 Set crossbracing in pairs at 250 mm (10") above finished floor and continuously weld to uprights.
 - .5 Continuously weld uprights to reinforcing saddles under table tops.
- .5 Shelving:
 - .1 1.6 mm stainless steel all welded construction.
 - .2 Boxed edges on all 4 sides. Notch comers to fit contour of legs as required for work tables.
 - .3 Shelves with sides or backs shall be turned up 50 mm (2") and set to backs or folded if away from walls.
 - .4 Shelves shall be easily removable and in sections capable of being pulled out through a single door opening.
 - .5 Overshelves to be boxed with backs set to walls and secured with stainless steel tubular brackets.
 - .6 Wire shelves to be 3 mm (1/8") O.D. on 25 mm (1") centres, set in a 10 mm (3/8") O.D. perimeter frame either stainless steel or heavy duty chrome plated finish as specified.
- .6 Sink Bowl:
 - .1 2.0 mm stainless steel integrally welded into table or counter top.
 - .2 Interior comers radiused 19 mm (3/4") both vertically and horizontally, all welded and polished. Slope bottom to drain fitting.
 - .3 Undercoat with sound deadening compound when sinks are not exposed.
 - .4 Multiple sinks to have 18 ga stainless steel apron to conceal gap between bowls.
 - .5 Faucets and drains as specked under "Hardware".

2.4 FABRICATION

- .1 Before fabrication commences, check all dimensions and conditions at the building site, including means of access into and through the building to the area where equipment is to be set in place, for all conditions affecting the delivery and installation of the equipment.
- .2 Fix and assemble work in the shop wherever possible. Execute the work in accordance with details and *Shop Drawings* which have been reviewed and accepted by the *Consultant*. Where complete or final shop fabrication is not possible, make a trial assembly in the shop prior to delivery.
- .3 Workmanship shall be of the best grade modern shop and field practice for the manufacturers who specialize in this work.

- .4 Fabricate and erect work square, plumb, straight and accurately fitted. *Provide* adequate reinforcing and anchorage in all places.
- .5 Insulate where necessary to prevent electrolysis.
- .6 All drillings to be reamed and exposed edges left clean and smooth.
- .7 Pop rivets shall not be used unless clearly noted on *Shop Drawings*, and then only if such drawings have been reviewed and accepted by the *Consultant*.
- .8 The methods of construction, reinforcement and anchorage, as well as details of finish, fitting and jointing, and other data indicated on *Shop Drawings* shall be accurately followed. No deviations from *Shop Drawings* which have been reviewed and accepted will be permitted during the construction of equipment or installation.
- .9 The gauge of metal and methods of construction shall in all cases be adequate for the various conditions to be met, with the requirements of the design details and *Specifications* considered as minimum. Finished equipment shall be rigid when assembled and installed.
- .10 All fastenings and fittings shall be stainless steel, type 302 or 304 unless otherwise specified. All bolts and screws shall have truss heads or flat heads which are properly countersunk, at exterior and interior surfaces which are normally visible. Concealed fastenings shall be used throughout, unless otherwise approved by the *Consultant*.
- .11 Sheet material for counter tops, tables, shelves and similar forms shall be straight lengths, in one continuous sheet if not over 3 metres long.
- .12 Make provisions in the equipment for proper installation of services and connections. Cut and patch only when necessary. The completed installation shall be properly finished without rough edges or exposed openings.
- .13 Allow for expansion and contraction of materials.
- .14 Obtain samples and confirm sizes of trays, racks, pans and china to determine the exact requirements for openings in equipment.
- .15 All millwork shall be glued and screwed. Nails shall be used as a secondary means of attachment. Both nails and screws must be set, plugged and finished.
- .16 Plastic laminate shall be applied in a continuous manner to match colour and pattern.
- .17 Welding:
 - .1 All welding shall conform to the requirements of CSA and be performed by fabricators who are approved by the Canadian Welding Bureau and CSA. Exposed welds shall be filed or ground smooth and flush and polished to match surfaces.
 - .2 Electric seamless welding shall utilize low carbon filler rod, coated with non-carbonaceous flux, with sufficient chromium and nickel so that the deposited metal and the original metal have the same composition.
 - .3 Welds shall be free from pits, cracks, discolouration and other imperfections.
 - .4 Welded joints shall be butt fitted, properly jugged, continuous, ground smooth and polished for both exposed conditions as well as unexposed welds on underside of equipment.
 - .5 Where soldering is desirable, it shall be made with tin-lead solder. In no case shall soldering be relied upon for the stability of the seam or joint. Soldering shall serve only as a filler to prevent leakage and shall not be considered as a replacement for welding or brazing.
 - .6 Butt joints made by spot welding or riveting straps under seams and filling with solder, puddled welds and exposed screws are not acceptable.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Site Verification of Conditions:
 - .1 Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

3.2 INSTALLATION

- .1 Caulk and seal equipment to walls, base pads, curbs, and adjacent equipment where required.
- .2 Leave installed work neat, cleaned and polished, well fitted into position, level, and in proper operating condition.
- .3 Promptly remove all rubbish and debris from the building and site as the work proceeds and on completion.
- .4 Activate, test and adjust all equipment and apparatus installed under this *Contract*. Refinish and repair any painted and finished surfaces damaged during erection and installation. Hand over the completed installation in first class condition and working order.
- .5 Ensure electrical equipment is accompanied by label or certification of approval by Canadian Standards Association, Hydro Electrical Power Commission or Local Authority.
- .6 Ensure steam pressure equipment is accompanied by a "Certificate of Boilers" to satisfy Federal and Provincial requirements.
- .7 Finished work must be perfectly true and plumb with no warping, buckling or open seams. All edges, hidden or exposed must be ground smooth and rounded. Rivet heads, weld marks, or other imperfections are not acceptable.
- .8 Cutting and repairs for the proper installation of services are part of the *Work* in this *Contract*.
- .9 Obtain permits or special inspections. No allowance will be made for costs incurred.
- .10 Identify equipment with metal plates or labels permanently secured which include, where applicable:
 - .1 Manufacturer's name or recognized trademark.
 - .2 Complete model identification.
 - .3 Model, serial number and CSA, ULC and NSF identifications.

3.3 FIELD QUALITY CONTROL

- .1 Site Inspection:
 - .1 All dimensions shown on *Drawings* or listed in this Section of the *Specification* are to be considered nominal and for guidance only. It is the responsibility of this *Subcontractor* to check dimensions on the site and to co-ordinate any adjustments which may be necessary for the proper fabrication and set-in-place of the foodservice equipment.
 - .2 If significant variances are apparent to this *Subcontractor* which may require changes affecting the intent of the *Contract*, immediately notify the *Consultant*.
 - .3 Fabricate equipment in sections that will allow easy access into the building and to final location within the foodservice area. Any damage to the building or the equipment will be this contractor's responsibility.

- .4 Verify on site actual dimensions of storerooms and walk-in refrigerators and freezers and adjust if necessary the size of shelving units specified in the item *Specification*.
- .5 Verify all points of access into site and ensure pieces of equipment or fabricated items installed or relocated are able to pass through doors, hallways etc. in order to arrive at designated location on plans.

3.4 DEMONSTRATION

- .1 After completion of installation, cleaning, testing and final inspection, instruct *Owner* or his authorized personnel in the correct operation and maintenance of equipment.
- .2 A demonstration shall be made of each piece of equipment requested by *Consultant*, and such demonstration shall be carried out by a competent representative of manufacturer's equipment.
- .3 It is the responsibility of this *Subcontractor* to correct deficiencies and make adjustments to items which are not functioning properly at the time of demonstration.
- .4 This *Subcontractor* shall co-ordinate the schedule for equipment demonstrations with *Owner's* representative, with adequate time allowed for each demonstration.
- .5 *Consultant* will inspect equipment on substantial completion of work and will issue a deficiency report immediately thereafter.
- .6 *Owner* reserves the right to inspect equipment at the factory of this *Subcontractor*, or at other locations as necessary.
- .7 Rejection of any equipment, components or fabrication will be based on degree of conformance to the *Specification* and *Drawings*, and is subject to the Conditions of the *Contract* in any matter of dispute.
- .8 All new equipment shall be warranted for a minimum of 1 year from the date of acceptance against defects in material, manufacture, assembly, labour and installation. Those items or components which have inherent warranty periods beyond this minimum shall be sustained to the maximum time provided by the manufacturer.
- .9 All refrigeration compressors shall be supplied with a 5 year replacement warranty.
- .10 If defects become apparent during warranty period they shall be made good by the *Supplier* or his authorized representative. *Supplier* is meant to be manufacturer of the item, but under any circumstance it is the responsibility of this *Subcontractor* to maintain the obligation of guarantee whether or not the *Supplier* provides this service.
- .11 The warranty shall not apply where it can be clearly shown that a defect or malfunction is due to misuse or neglect by the *Owner* or his representative.
- .12 The warranty period shall commence upon acceptance of the equipment by the *Owner*, or such date(s) as may be mutually agreed upon after substantial completion of the *Work*. In no event shall the period of warranty begin later than the date upon which the lien holdback expires.

3.5 SCHEDULES

- .1 Refer to Drawings and Equipment Schedule for food service equipment scope.
- .2 Where a manufacturer's name and model number is indicated, the item shall be supplied with all standard components, features and materials whether specifically identified or not, and shall be considered inherent in this *Specification*.
- .3 Items identified as custom fabricated shall be constructed of stainless steel unless otherwise specified. Refer to detail drawings at the end of this Section for general fabrication methods for all items.

- .4 Verify mechanical and electrical services on existing equipment to be reused. Include in bid price all modifications or adjustments to this equipment which are necessary to meet the mechanical and electrical services as shown on plans and *Specifications*.
- .5 Mechanical and electrical characteristics of existing equipment indicated in the schedules are from manufacturers published literature sheets. These are to be considered nominal, or a guide only. Actual mechanical and electrical characteristics of existing equipment must be confirmed by *Contractor*.

END OF SECTION



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Massachusetts, New Jersey, Ohio, Texas, Washington

Bottom Mount Reach-In Refrigerators

MODELS:

MBF8505GR / MBF8505GRL

MBF8507GR / MBF8508GR

Standard Features

- Bottom mount compressor units with environmentally friendly R290 refrigerant
- Stainless steel exterior & interior
- Left hand hinge model available (MBF8505GRL)
- Dixell digital controller
- Maintains temperatures between 33°F – 40°F
- LED interior light(s)
- Recessed door handle(s)
- Door lock(s) standard
- Magnetic door gasket(s) standard for positive door seal
- Pre-installed casters
- Three(3) pre-installed shelves per section
- Down duct refrigeration to ensure even distribution of air



MBF8505GR(L)



MBF8507GR



MBF8508GR

Optional Accessories

- Extra shelves – includes 4 shelf clips per shelf
MBF8505GR(L) shelf part #: W0402393
MBF8507GR shelf part #: W0402387
MBF8508GR shelf part #: W0402387 left/right shelf, part #: W0402388 middle shelf

For the best results of food preservation we recommend setting your refrigerator between 33 °F to 38 °F

1. Don't forget to leave the unit some room to breathe!
2. Please clean the condenser frequently to give the unit more fresh air.



2 YEAR PARTS AND LABOR WARRANTY (US ONLY)
5 YEAR COMPRESSOR PART WARRANTY (US ONLY)



For confirmation and updates on the latest energy star models, please visit energystar.gov



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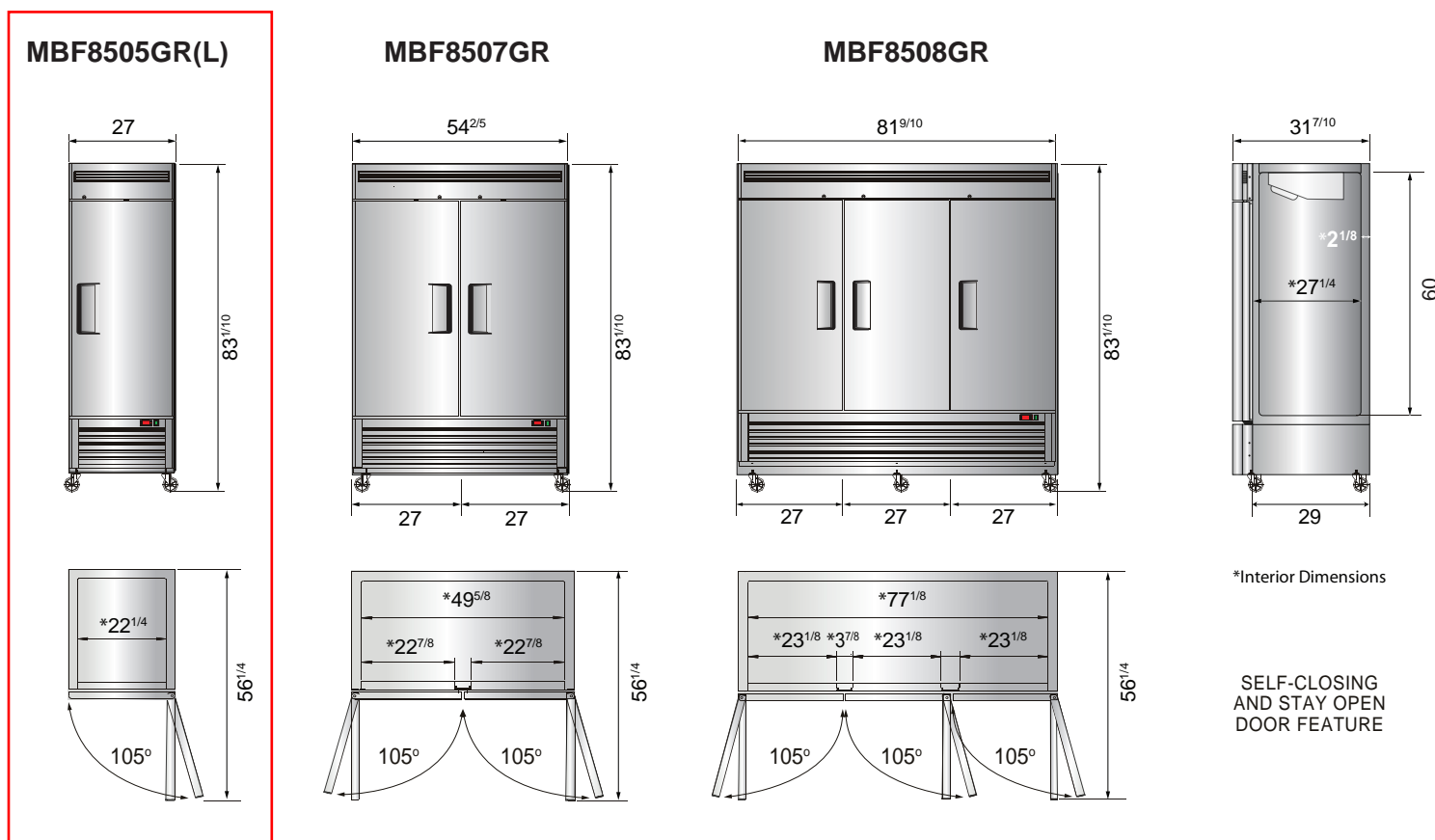
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SPECIFICATIONS

Models	Door	Capacity (Cu.Ft.)	Shelves	Casters (inch)	Amps (A)	Voltage (V/Hz/Ph)	HP	Refrigerant	Exterior Dimensions (inch)	Net Weight (lbs)	Gross Weight (lbs)
MBF8505GR(L)	1	19.1	3	4	2.1	115/60/1	1/7	R290	27×31 ^{7/10} ×83 ^{1/10}	249	282
MBF8507GR	2	43.8	6	4	3.2	115/60/1	1/5	R290	54 ^{2/5} ×31 ^{7/10} ×83 ^{1/10}	397	452
MBF8508GR	3	68	9	4	4.2	115/60/1	1/4	R290	81 ^{9/10} ×31 ^{7/10} ×83 ^{1/10}	538	615

PLAN VIEW



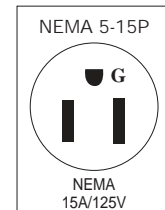
Casters

Epoxy shelves

Door lock

Down duct

Temperature control





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California, Colorado, Florida, Georgia, Illinois,
Massachusetts, New Jersey, Ohio, Texas, Washington

Bottom Mount Reach-In Freezers

MODELS:

MBF8501GR / MBF8501GRL
MBF8503GR / MBF8504GR

Standard Features

- Bottom mount compressor units with environmentally friendly R290 refrigerant
- Stainless steel exterior & interior
- Left hand hinge model available (MBF8501GRL)
- Dixell digital controller
- Maintains temperatures between -8°F – 0°F
- LED interior light(s)
- Recessed door handle(s)
- Door lock(s) standard
- Magnetic door gasket(s) standard for positive door seal
- Pre-installed casters
- Three(3) pre-installed shelves per section
- Down duct refrigeration to ensure even distribution of air



MBF8501GR(L)



MBF8503GR



MBF8504GR

Optional Accessories

- Extra shelves – includes 4 shelf clips per shelf
MBF8501GR(L) shelf part #: W0402393
MBF8503GR shelf part #: W0402387
MBF8504GR left and right shelf part #: W0402387
MBF8504GR middle shelf part #: W0402388



MBF8503GR

For the best results of food preservation we recommend setting your freezer between -8 °F to 0 °F

1. Don't forget to leave the unit some room to breathe!
2. Please clean the condenser frequently to give the unit more fresh air.



2 YEAR PARTS AND LABOR WARRANTY (US ONLY)
5 YEAR COMPRESSOR PART WARRANTY (US ONLY)



For confirmation and updates on the latest energy star models, please visit energystar.gov



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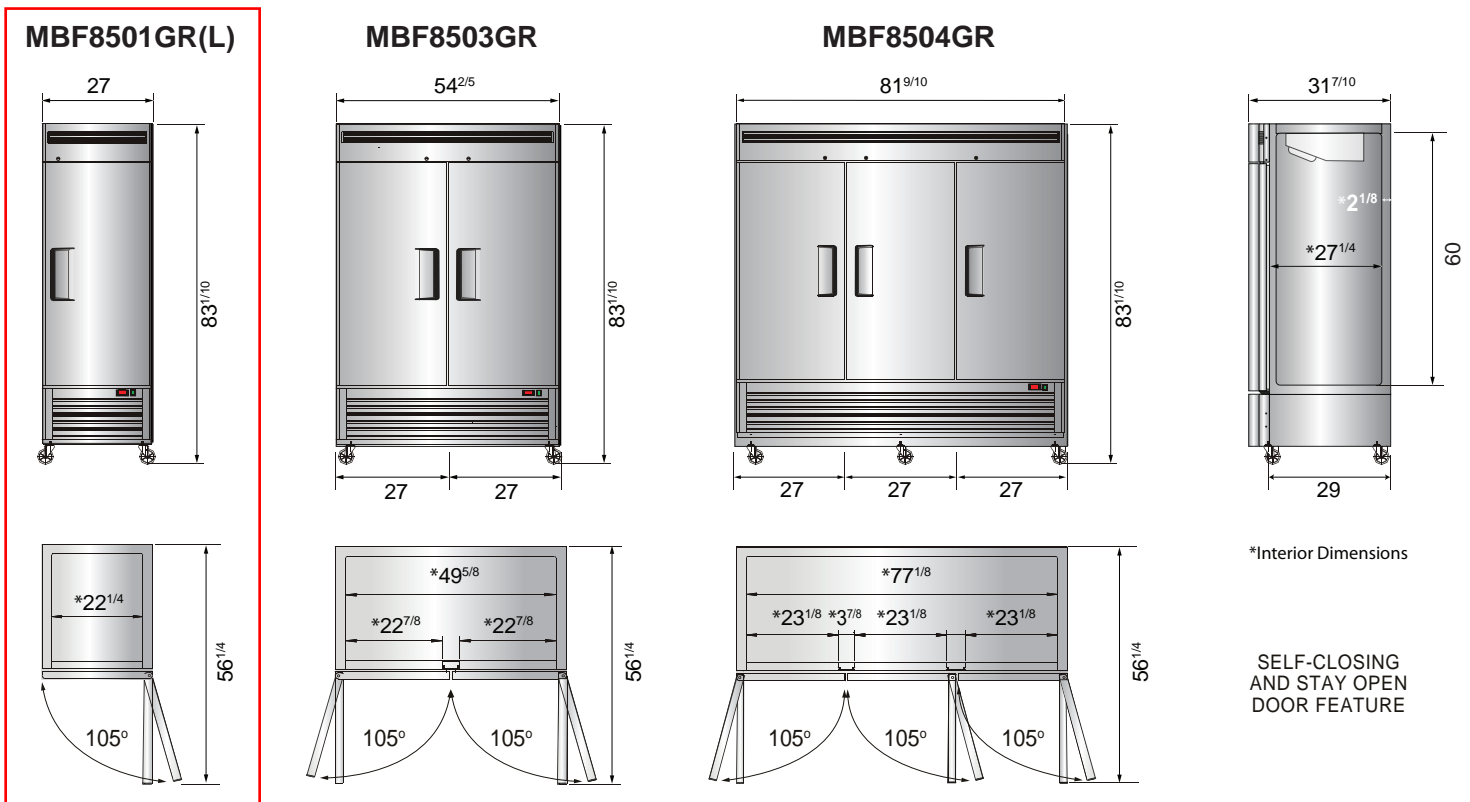
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SPECIFICATIONS

Models	Door	Capacity (Cu.Ft.)	Shelves	Casters (inch)	Amps (A)	Voltage (V/Hz/Ph)	HP	Refrigerant	Exterior dimensions (inch)	Net weight (lbs)	Gross weight (lbs)
MBF8501GR(L)	1	19.1	3	4	6.3	115/60/1	1/2	R290	27×31 ^{7/10} ×83 ^{1/10}	265	298
MBF8503GR	2	44.8	6	4	8.6	115/60/1	3/4	R290	54 ^{2/5} ×31 ^{7/10} ×83 ^{1/10}	410	465
MBF8504GR	3	68	9	4	6.2	208-230/115/60/1	1	R290	81 ^{9/10} ×31 ^{7/10} ×83 ^{1/10}	551	628

PLAN VIEW



Casters

Epoxy shelves

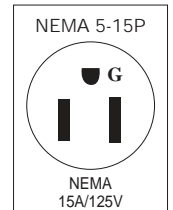
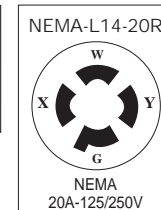
Door lock

Down duct

Temperature control

MBF8504GR

MBF8501GR(L)
MBF8503GR

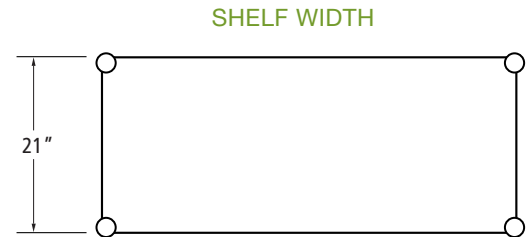


Shelving

Wire Shelving

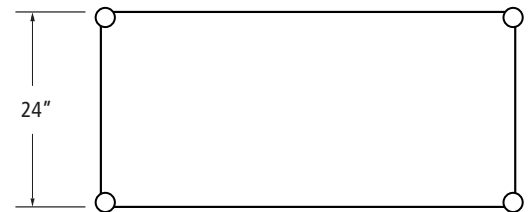
21" CHROME SHELVING

Product #	Shelf Width	Quantity In Box	Shipping Dimensions			Weight (lbs)
			L"	W"	H"	
N-S2124C	24	4	25	22	7	30
N-S2130C	30	4	31	22	7	35
N-S2136C	36	4	37	22	7	40
N-S2142C	42	4	43	22	7	48
N-S2148C	48	4	49	22	7	54
N-S2154C	54	2	55	22	4	32
N-S2160C	60	2	61	22	4	35
N-S2172C	72	2	73	22	4	42



24" CHROME SHELVING

Product #	Shelf Width	Quantity In Box	Shipping Dimensions			Weight (lbs)
			L"	W"	H"	
N-S2424C	24	4	25	25	7	34
N-S2430C	30	4	31	25	7	41
N-S2436C	36	4	37	25	7	48
N-S2442C	42	4	43	25	7	55
N-S2448C	48	4	49	25	7	62
N-S2454C	54	2	55	25	4	37
N-S2460C	60	2	61	25	4	42
N-S2472C	72	2	73	25	4	50



CHROME PLATED POSTS WITH FEET

Product #	Post Length	Quantity In Box	Shipping Dimensions			Weight (lbs)
			L"	W"	H"	
N-P34C	34	4	36	5	2	9
N-P54C	54	4	56	5	2	13
N-P63C	63	4	65	5	2	15
N-P72C	72	4	74	5	2	17
N-P74C	74	4	76	5	2	17
N-P86C	86	4	88	5	2	20

>> **EFI Product Feature:** All units are shipped unassembled to reduce shipping costs.

Shipping specifications are approximate.

CHROME PLATED POSTS NO FEET

Product #	Post Length	Quantity In Box	Shipping Dimensions			Weight (lbs)
			L"	W"	H"	
N-P63C-NF	63	4	64	5	2	15
N-P72C-NF	72	4	73	5	2	17
N-P74C-NF	74	4	75	5	2	18
N-P86C-NF	86	4	87	5	2	20

Specifications subject to change without notice.





BRUTE® containers are guaranteed to never fade, warp, crack, or crush, with a proprietary design constructed with the highest quality material.

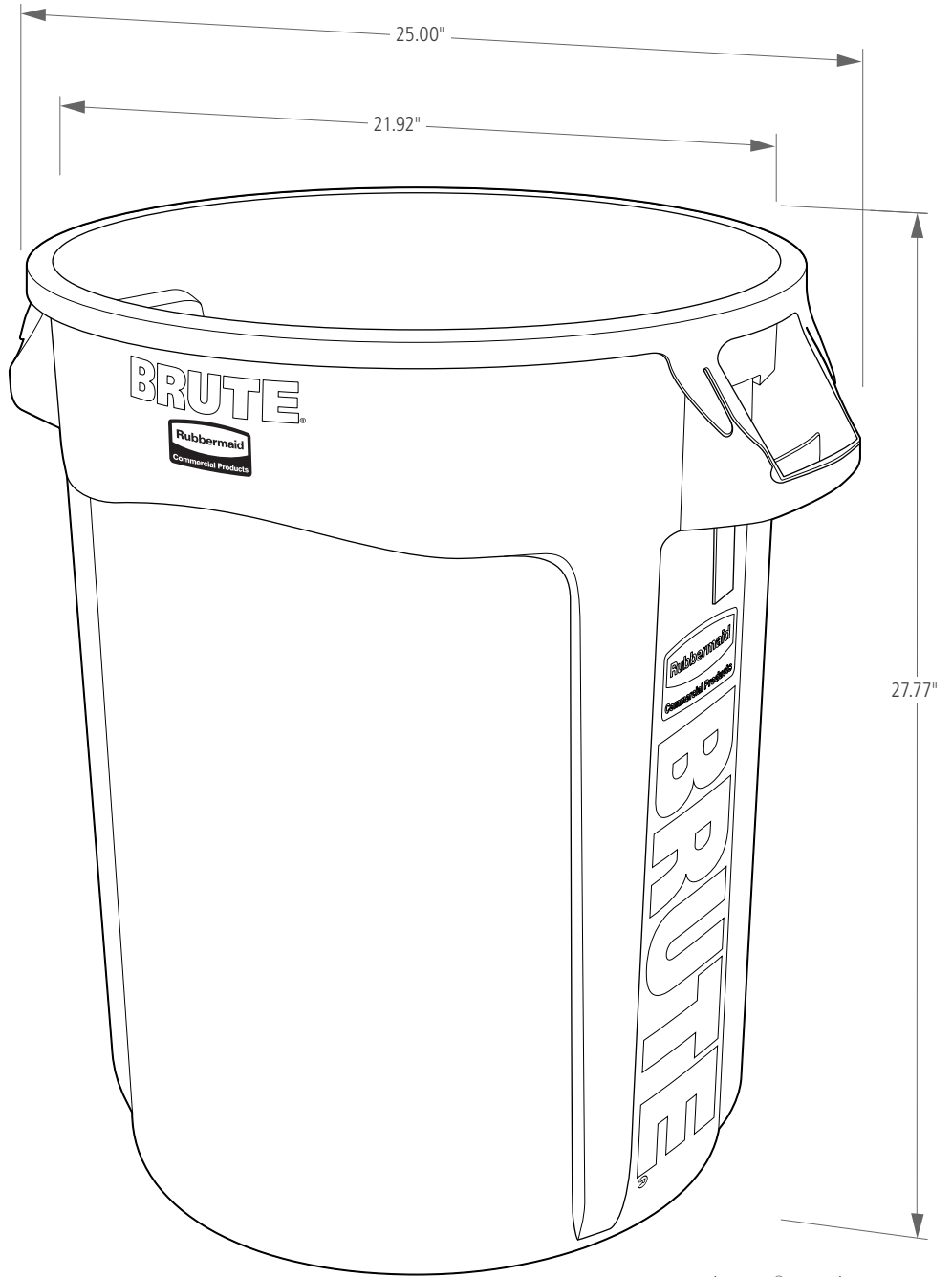
Features and Benefits:

- Venting channels make removing liners up to 50% easier, improving productivity and reducing the risk of injury
- Commercial-grade construction guaranteed to never fade, warp, crack, or crush
- Bag cinches secure liners, allowing for knot-free liner changes. Tested to 200,000 cycles
- Contoured base handles improve grip and ergonomics, reducing strain and improving efficiency
- Rim with rib-strengthened design increases strength and resists crushing
- Rounded handles make lifting and moving easier
- Reinforced base is specifically engineered to be dragged over rough surfaces in tough environments



2 & 21 Compliant

BRUTE® CONTAINERS



Vented BRUTE® 32-Gal. Container

BRUTE® CONTAINERS

SKU #	DESCRIPTION	COLOR	CAPACITY	HEIGHT	DIAMETER	DIAMETER WITH HANDLE	PACK SIZE
			GAL	IN	IN	IN	
FG261000GRAY	BRUTE® 10 GALLON CONTAINER	GRAY	10G	17.13	15.63	18.00	6
FG261000WHT	BRUTE® 10 GALLON CONTAINER	WHITE	10G	17.13	15.63	18.00	6
FG261000RED	BRUTE® 10 GALLON CONTAINER	RED	10G	17.13	15.63	18.00	6
FG261000YEL	BRUTE® 10 GALLON CONTAINER	YELLOW	10G	17.13	15.63	18.00	6
1779699	BRUTE® 10 GALLON CONTAINER	BLUE	10G	17.13	15.63	18.00	6
FG261000DGRN	BRUTE® 10 GALLON CONTAINER	DARK GREEN	10G	17.13	15.63	18.00	6
1926827	BRUTE® 10 GALLON CONTAINER	BLACK	10G	17.13	15.63	18.00	6
FG262000GRAY	BRUTE® 20 GALLON CONTAINER	GRAY	20G	22.91	19.38	22.50	6
FG262000WHT	BRUTE® 20 GALLON CONTAINER	WHITE	20G	22.91	19.38	22.50	6
FG262000RED	BRUTE® 20 GALLON CONTAINER	RED	20G	22.91	19.38	22.50	6
FG262000YEL	BRUTE® 20 GALLON CONTAINER	YELLOW	20G	22.91	19.38	22.50	6
FG262000BLUE	BRUTE® 20 GALLON CONTAINER	BLUE	20G	22.91	19.38	22.50	6
FG262000DGRN	BRUTE® 20 GALLON CONTAINER	DARK GREEN	20G	22.91	19.38	22.50	6
1779734	BRUTE® 20 GALLON CONTAINER	BLACK	20G	22.91	19.38	22.50	6
FG262073BLUE	BRUTE® 20 GALLON RECYCLING CONTAINER	BLUE	20G	22.91	19.38	22.50	6
1926828	BRUTE® 20 GALLON RECYCLING CONTAINER	DARK GREEN	20G	22.91	19.38	22.50	6
FG263200GRAY	BRUTE® 32 GALLON CONTAINER	GRAY	32G	27.77	21.92	25.00	6
FG263200WHT	BRUTE® 32 GALLON CONTAINER	WHITE	32G	27.77	21.92	25.00	6
FG263200RED	BRUTE® 32 GALLON CONTAINER	RED	32G	27.77	21.92	25.00	6
FG263200YEL	BRUTE® 32 GALLON CONTAINER	YELLOW	32G	27.77	21.92	25.00	6
FG263200BLUE	BRUTE® 32 GALLON CONTAINER	BLUE	32G	27.77	21.92	25.00	6
FG263200DGRN	BRUTE® 32 GALLON CONTAINER	DARK GREEN	32G	27.77	21.92	25.00	6
1867531	BRUTE® 32 GALLON CONTAINER	BLACK	32G	27.77	21.92	25.00	6
FG263273BLUE	BRUTE® 32 GALLON RECYCLING CONTAINER	BLUE	32G	27.77	21.92	25.00	6
1788472	BRUTE® 32 GALLON RECYCLING CONTAINER	DARK GREEN	32G	27.77	21.92	25.00	6
FG264360GRAY	BRUTE® 44 GALLON CONTAINER	GRAY	44G	31.50	24.00	27.75	4
1779740	BRUTE® 44 GALLON CONTAINER	WHITE	44G	31.50	24.00	27.75	4
FG264360RED	BRUTE® 44 GALLON CONTAINER	RED	44G	31.50	24.00	27.75	4
FG264360YEL	BRUTE® 44 GALLON CONTAINER	YELLOW	44G	31.50	24.00	27.75	4
FG264360BLUE	BRUTE® 44 GALLON CONTAINER	BLUE	44G	31.50	24.00	27.75	4
1779741	BRUTE® 44 GALLON CONTAINER	DARK GREEN	44G	31.50	24.00	27.75	4
FG264360BLA	BRUTE® 44 GALLON CONTAINER	BLACK	44G	31.50	24.00	27.75	4
FG264307BLUE	BRUTE® 44 GALLON RECYCLING CONTAINER	BLUE	44G	31.50	24.00	27.75	4
1926829	BRUTE® 44 GALLON RECYCLING CONTAINER	DARK GREEN	44G	31.50	24.00	27.75	4
FG265500GRAY	BRUTE® 55 GALLON CONTAINER	GRAY	55G	33.19	26.38	30.75	3
FG265500WHT	BRUTE® 55 GALLON CONTAINER	WHITE	55G	33.19	26.38	30.75	3
FG265500RED	BRUTE® 55 GALLON CONTAINER	RED	55G	33.19	26.38	30.75	3
FG265500YEL	BRUTE® 55 GALLON CONTAINER	YELLOW	55G	33.19	26.38	30.75	3
1779732	BRUTE® 55 GALLON CONTAINER	BLUE	55G	33.19	26.38	30.75	3
FG265500DGRN	BRUTE® 55 GALLON CONTAINER	DARK GREEN	55G	33.19	26.38	30.75	3
1779739	BRUTE® 55 GALLON CONTAINER	BLACK	55G	33.19	26.38	30.75	3



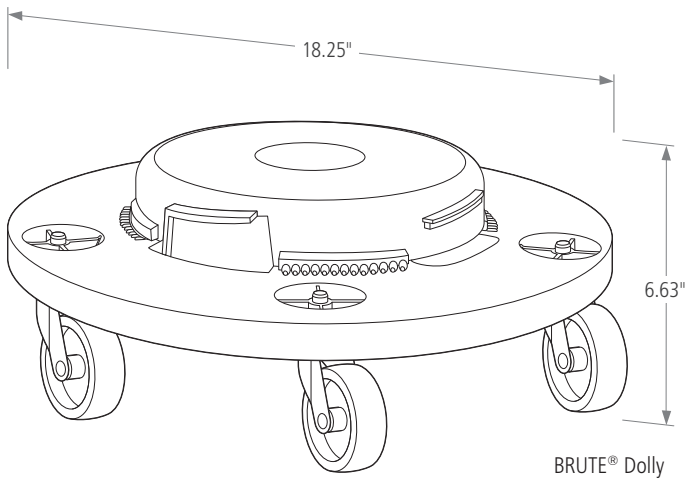
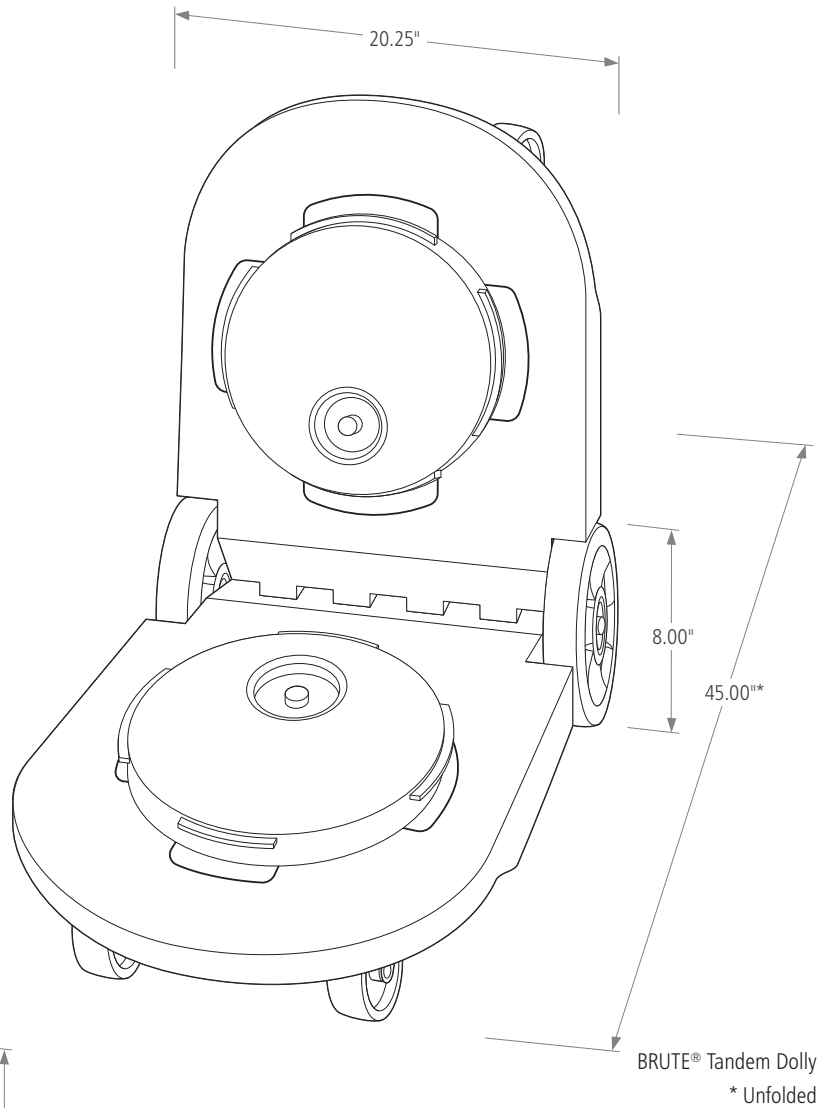


BRUTE® dollies are designed to be durable, long-lasting, and are able to withstand the toughest commercial environments while simplifying everyday tasks.

Features and Benefits:

- Rugged casters help keep fully loaded BRUTE® containers stable, even on rough and uneven floors, and swivel smoothly for easy maneuvering
- Twist locks hold containers securely in place and unlock easily for unloading, allowing for easy transport
- Structural foam construction provides superior strength and durability

BRUTE® DOLLIES



BRUTE® DOLLIES

SKU #	DESCRIPTION	COLOR	FITS	LENGTH	WIDTH	HEIGHT	DIAMETER	PACK SIZE
				IN	IN	IN	IN	
FG264000BLA	BRUTE® DOLLY	BLACK	ALL	-	-	6.63	18.25	2
FG264043BLA	BRUTE® QUIET DOLLY	BLACK	ALL	-	-	6.63	18.25	2
FG264600BLA	BRUTE® TANDEM DOLLY	BLACK	ALL	45.00	20.25	8.00	-	1



FMD DBC-3 BLK

30.0" x 23.3" x 11.3"
(76.2cm x 59.2cm x 28.7cm)



 Servers and airpots sold separately

- Each mixing chamber has independent powder to water ratio
- Easy-to-program, one-touch portion control for 3 cup sizes
- Simple setup and hopper throw calibration system
- System setup is password protected for safety
- Adjustable legs and drip tray accommodate 20oz (.59L) mugs easily
- Electrical and plumbing components easily accessible through front and top
- High speed heavy-duty whipper for complete product mixing
- Improved automatic rinsing of whipper reduces run-on after beverage is dispensed
- Large easy-to-fill translucent hoppers hold 4lb (1.81 kg) of product each, ensuring quick and timely refilling
- Lighted front graphics for merchandising are easy to exchange: cappuccino or soup
- Variable speed motors allow control of product consistency in mixing chamber (.75 to 6.6 grams of powder per second)

Agency:



Specifications

Product #: 29250.0000

Water Access: Plumbed

Finish: Black

Hoppers: Three

Door: Lit

Door: Side Hinge

Dispense: Portion Control

Additional Features

DBC

Electrical & Capacity

Volts	Amps	Watts	Cord Attached	Plug Type	8oz cups/hr 236ml cups/hr	Input H ₂ O Temp.	Phase	# Wires plus Ground	Hertz
120	15	1800	Yes	NEMA 5-15P	83	60°F (15.5°C)	1	2	60

Plumbing Requirements

PSI	kPa	Fitting Supplied	Water Flow Required (GPM)
20-90	138-621	1/4" Male Flare Fitting	-

CAD Drawings

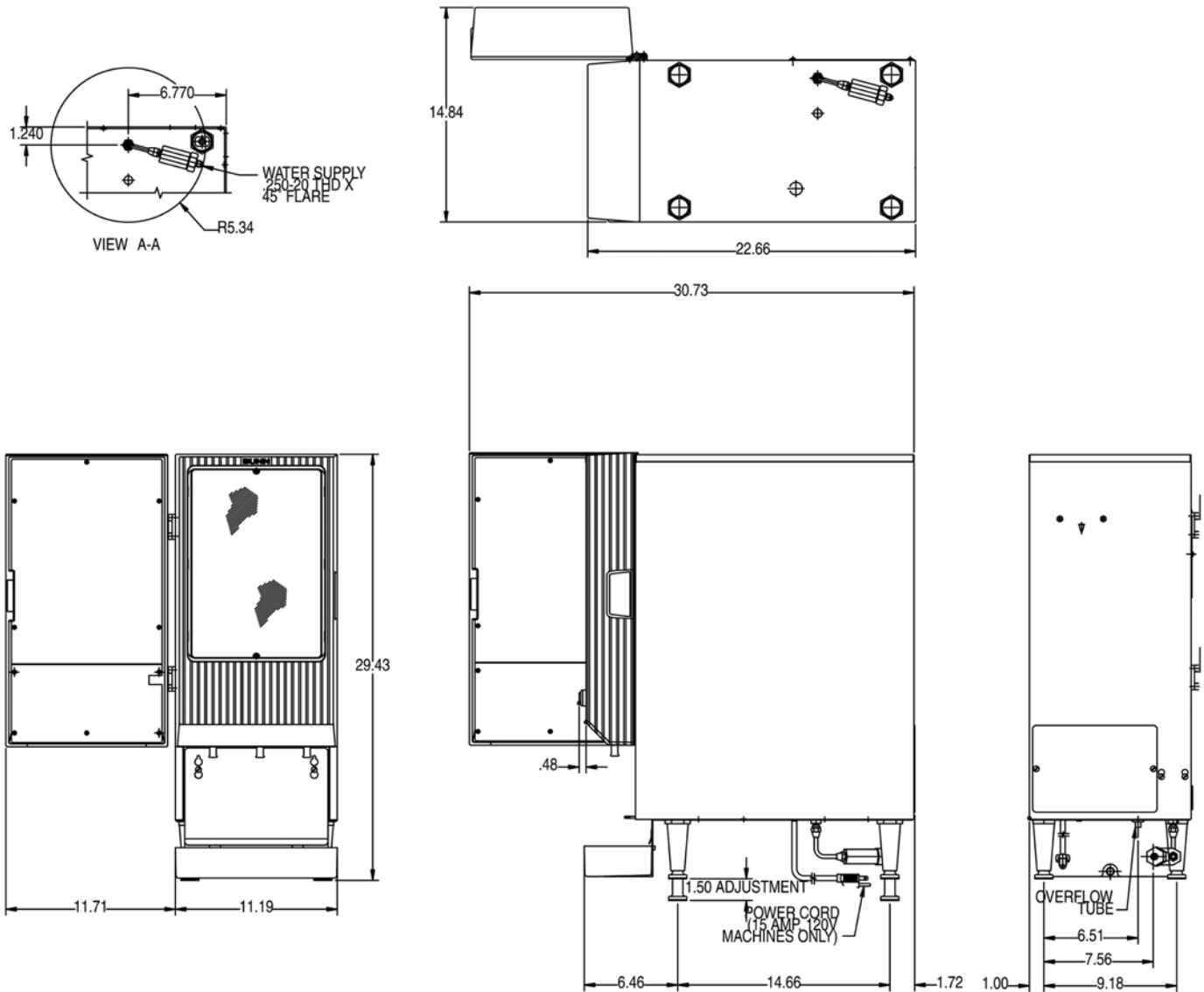
2D	Revit	KLC
●		



BUNN® reserves the right to change specifications and product design without notice. Such revisions do not entitle the buyer to corresponding changes, improvements, additions or replacements for previously purchased equipment.

Created on:
09/13/2017

For most current specifications and other info visit bunn.com.



Unit			Shipping					
	Width	Height	Depth	Width	Height	Depth	Weight	Volume
English	11.3 in.	30.0 in.	23.3 in.	16.1 in.	35.8 in.	26.8 in.	85.000 lbs	7.620 ft ³
Metric	28.7 cm	76.2 cm	59.2 cm	40.9 cm	90.9 cm	68.1 cm	38.556 kgs	0.216 m ³



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Created on:
09/13/2017

Related Products & Accessories:FMD DBC-3 BLK(29250.0000)



WATER FILTER,
EQHP-10L

Product #: 39000.0001



WATER FILTER,
EQHP-10

Product #: 39000.0004

VP17-3, SST (2U/1L Warmer)

19.0" x 18.8" x 8.4"
(48.3cm x 47.8cm x 21.3cm)

- Pourover brewer requires no plumbing – completely portable
- SplashGard® funnel deflects hot liquids away from the hand
- All stainless steel construction
- Three individually controlled warmers



Servers and airpots sold separately

Agency:



Specifications

Additional Features

- Product #:** 13300.0004
Water Access: Not Plumbed
Finish: Stainless
Funnel: Black Plastic
Warmers: Two Upper/ One Lower

Electrical & Capacity

Volts	Amps	Watts	Cord Attached	Plug Type	8oz cups/hr 236ml cups/hr	Input H ² O Temp.	Phase	# Wires plus Ground	Hertz
120	13.9	1670	Yes	NEMA 5-15P	62	60°F (15.5°C)	1	2	60

Plumbing Requirements

CAD Drawings

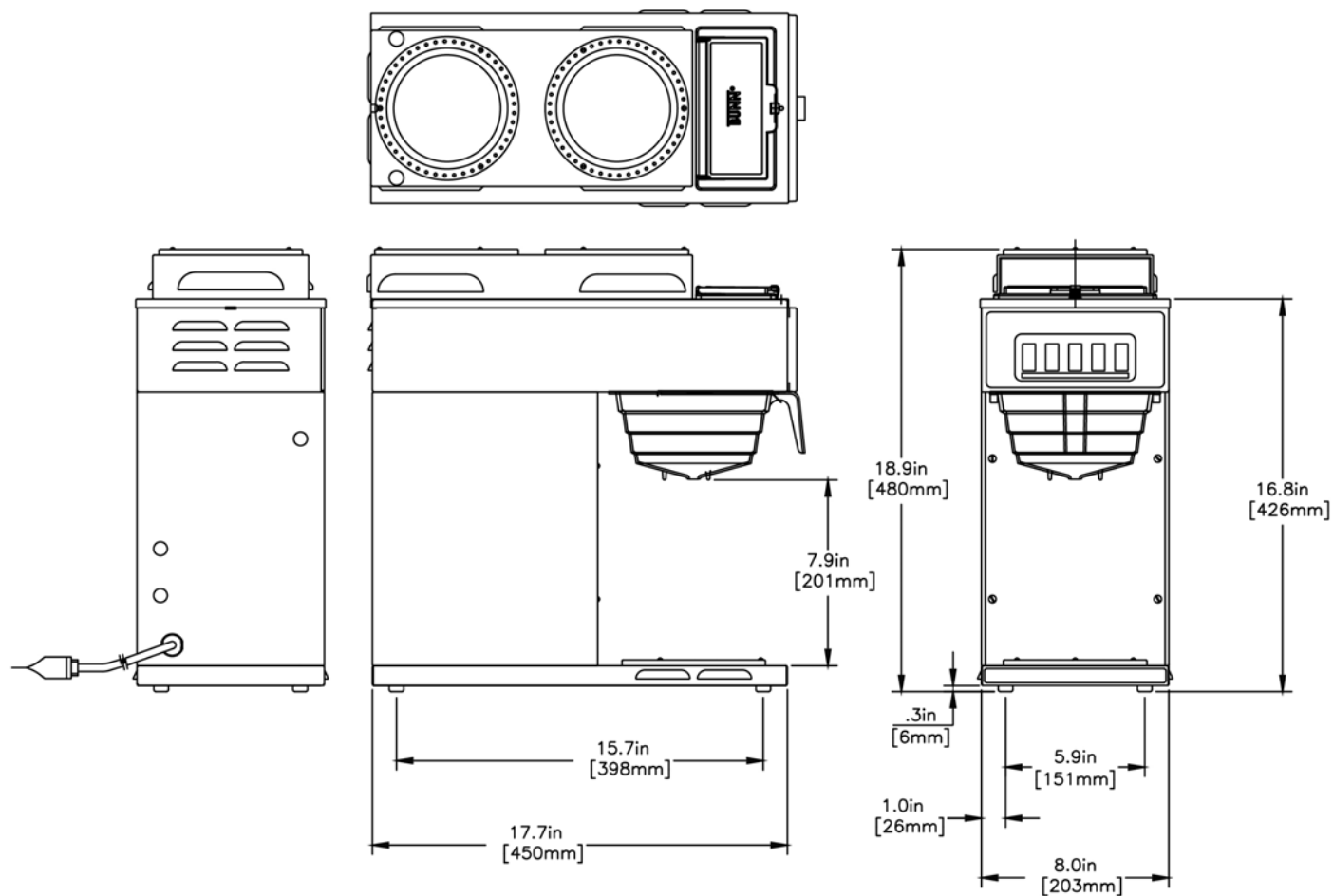
PSI	kPa	Fitting Supplied	Water Flow Required (GPM)
-	-	-	-

2D	Revit	KLC
●		



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Created on:
09/14/2017



	Unit			Shipping				
	Width	Height	Depth	Width	Height	Depth	Weight	Volume
English	8.4 in.	19.0 in.	18.8 in.	11.9 in.	22.5 in.	25.9 in.	28.150 lbs	3.896 ft ³
Metric	21.3 cm	48.3 cm	47.8 cm	30.2 cm	57.2 cm	65.8 cm	12.769 kgs	0.110 m ³



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Created on:
09/14/2017

Related Products & Accessories:VP17-3, SST (2U/1L Warmer)(13300.0004)



WX2, 120V

Product #: 06310.0004



PARRILLA

Product #: 06310.0004



WX1, 120V

Product #: 06450.0004

FILTERS,REGULAR1M
500/2 50/CL

Product #: 20115.0000



PAPEL FILTRANTE

Product #: 20115.0000

Serving & Holding Options: VP17-3, SST (2U/1L Warmer)(13300.0004)

				
EASY POUR,(BLK) 1/CS Product #:06100.0101	EASY POUR,(BLK) 2/CS Product #:06100.0102	JARRAS Product #:06100.0102	EASY POUR,(BLK) 3/CS Product #:06100.0103	JARRAS Product #:06100.0103
				
EASY POUR,(BLK) 6/CS Product #:06100.0106	JARRAS Product #:06100.0106	EASY POUR,(BLK) 12/CS Product #:06100.0112	EASY POUR,(BLK) 24/CS Product #:06100.0124	EASY POUR,(BLK) 6-1/2 CS Product #:06100.0156
				
EASY POUR,(ORN) 1/CS Product #:06101.0101	EASY POUR,(ORN) 2/CS Product #:06101.0102	JARRAS Product #:06101.0102	EASY POUR,(ORN) 3/CS Product #:06101.0103	EASY POUR,(ORN) 6/CS Product #:06101.0106
				
JARRAS Product #:06101.0106	EASY POUR,(ORN) 12/CS Product #:06101.0112	EASY POUR,(ORN) 24/CS Product #:06101.0124	DECANTER, GLASS-BLK 12C 24/CS Product #:42400.0024	DECANTER, GLASS-BLK 12CUP 1PK Product #:42400.0101



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Created on:
09/14/2017

Serving & Holding Options: VP17-3, SST (2U/1L Warmer)(13300.0004)



DECANTER, GLASS-BLK
12C 3/CS

Product #:42400.0103



DECANTER, GLASS-ORN
12C 24/CS

Product #:42401.0024



DECANTER, GLASS-ORN
12 CUP 1PK

Product #:42401.0101



DECANTER, GLASS-ORN
12C 3/CS

Product #:42401.0103



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Created on:
09/14/2017

64oz Blk Hndl Easy Pour Decanter(3pk)

0.0" x 0.0" x 0.0"
(0.0cm x 0.0cm x 0.0cm)

- Base is high quality stainless steel



Agency:

Specifications

Product #: 06100.0103

Handle: Black

Additional Features

Holding Capacity

English	Metric
-	-



BUNN® reserves the right to change specifications and product design without notice. Such revisions do not entitle the buyer to corresponding changes, improvements, additions or replacements for previously purchased equipment. For most current specifications and other info visit bunn.com.

Created on:
07/31/2017

Unit			Shipping					
	Width	Height	Depth	Width	Height	Depth	Weight	Volume
English	-	-	-	-	-	-	3.000 lbs	0.750 ft ³
Metric	-	-	-	-	-	-	1.361 kgs	0.021 m ³



BUNN® reserves the right to change specifications and product design without notice. Such revisions do not entitle the buyer to corresponding changes, improvements, additions or replacements for previously purchased equipment.
 For most current specifications and other info visit bunn.com.

Created on:
 07/31/2017

Related Products & Accessories: 64oz Blk Hndl Easy Pour Decanter(3pk)(06100.0103)



WX2, 120V
Product #: 06310.0004



PARRILLA
Product #: 06310.0004



WX2A, 230V 50/60HZ
Product #: 06310.0006



STOVE, WX2 120V/200W
Product #: 06310.6000



WX1, 120V
Product #: 06450.0004



STOVE, WX1 120V/100W
Product #: 06450.6000

NO IMAGE AVAILABLE

WL2, 120V
Product #: 11402.0001

NO IMAGE AVAILABLE

STOVE, WL2-120V/200W
Product #: 11402.6000


NO IMAGE AVAILABLE

STOVE, WS2-120V/200W
Product #: 12882.6000

Ultra-2 HP BLK Manual Fill

32.0" x 24.5" x 16.0"
(81.3cm x 62.2cm x 40.6cm)



 Servers and airpots sold separately

- Two large 3gal (11.4L) hoppers for optimum cooling and serving capacity
- Enhanced “no-lube” design on faucets and seals which simplifies installation and cleaning
- Full 2-year parts and 1-year labor warranty. 5-year parts and 1-year labor warranty on compressor and 3-year parts and labor warranty on electronics. See the product manual for additional details.
- Refrigeration system internally monitored to ensure long lasting performance
- Reversing auger design quickens freeze time and reduces air mixing
- Very simple to program and run with touchpad display, which also guides cleaning and preventive maintenance
- Sanitation listed by NSF to Standard 18 (includes dairy & alcohol)

Agency:



Specifications

Product #: 34000.0080
Water Access: Not Plumbed
Finish: Black
Hoppers: Two
Handle: Extended Handle

Additional Features

Electrical & Capacity

Volts	Amps	Watts	Cord Attached	Plug Type	8oz cups/hr 236ml cups/hr	Input H ₂ O Temp.	Phase	# Wires plus Ground	Hertz
120	12	1440	Yes	NEMA 5-15P	-	60°F (15.5°C)	1	2	50/60

Plumbing Requirements

PSI	kPa	Fitting Supplied	Water Flow Required (GPM)
-	-	-	-

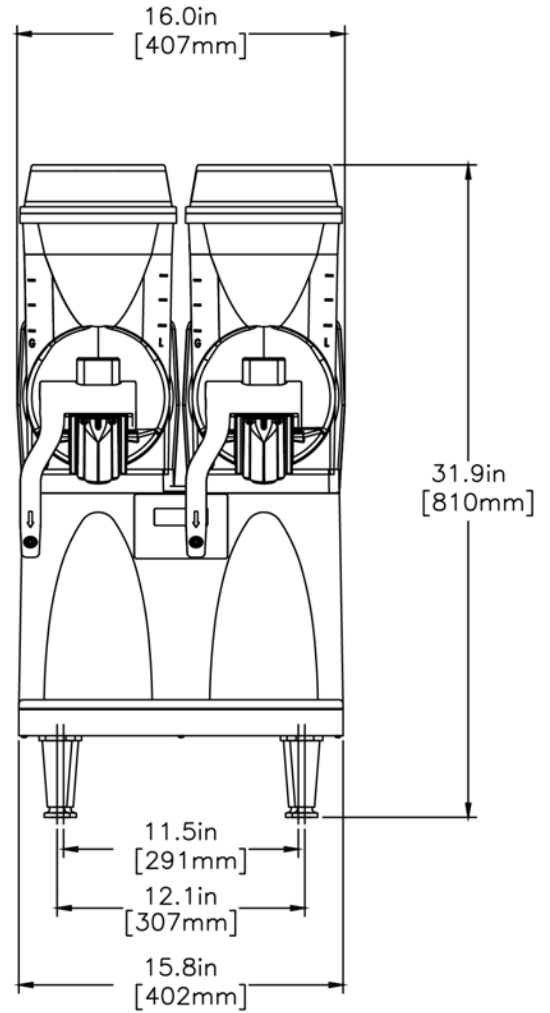
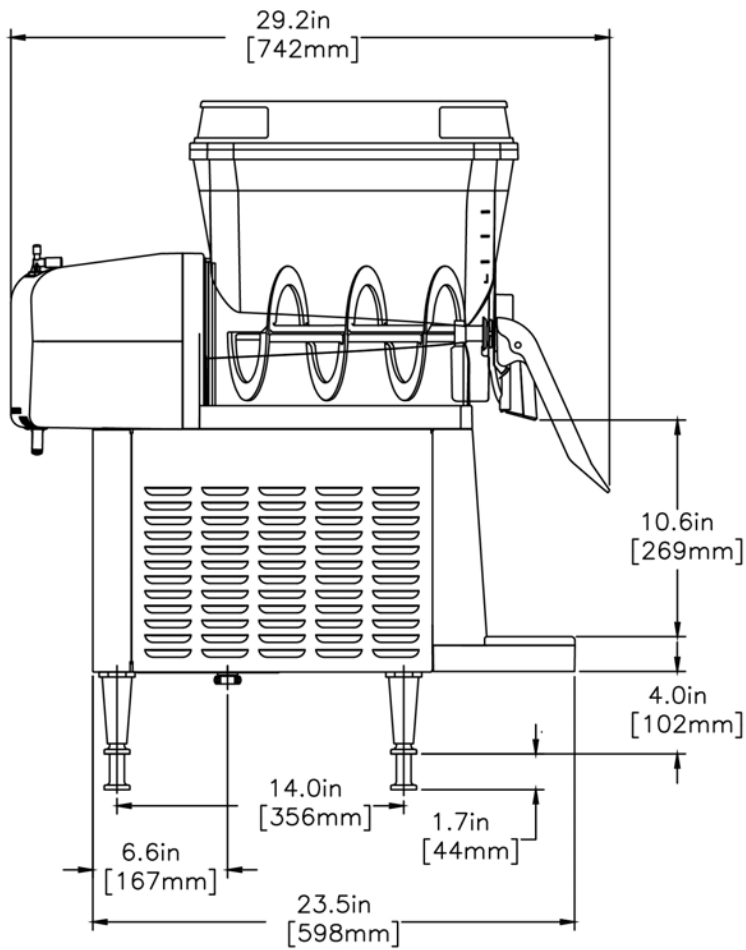
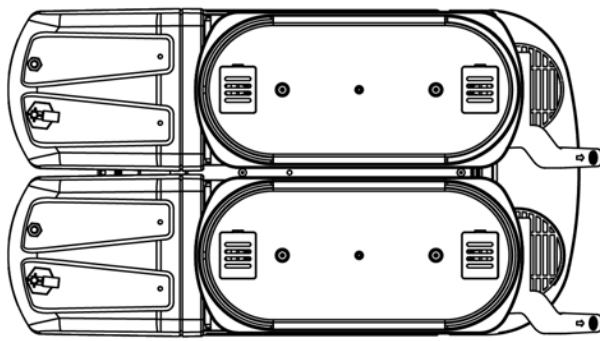
CAD Drawings

2D	Revit	KLC
●		



BUNN® reserves the right to change specifications and product design without notice. Such revisions do not entitle the buyer to corresponding changes, improvements, additions or replacements for previously purchased equipment.
 For most current specifications and other info visit bunn.com.

Created on:
06/30/2017




Unit				Shipping				
	Width	Height	Depth	Width	Height	Depth	Weight	Volume
English	16.0 in.	32.0 in.	24.5 in.	-	-	-	137.260 lbs	-
Metric	40.6 cm	81.3 cm	62.2 cm	-	-	-	62.261 kgs	-



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Created on:
06/30/2017

Related Products & Accessories: Ultra-2 HP BLK Manual Fill(34000.0080)



DRIP TRAY ASSY,
LOWER-BLK

Product #: 28086.0001



CHAROLA

Product #: 28086.0001

COVER, DRIP TRAY
ULTRA 2 BLK

Product #: 32068.0001

ULTRA LAF KIT,SEP
WATER LINES

Product #: 37960.0000

KIT, CFV UPGRADE W/
HPRS ULTRA-2 BLK .035

Product #: 44071.0101



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Created on:
06/30/2017



Item No. _____

Quantity _____

Model Nos. 8027-SLT, 8036-SLT, 8045W-SLT
GripsIt 8027SX-SLT, 8036SX-SLT, 8045SXW-SLT

Hot Dog Roller Grills (Slanted)

AIA File No. _____



8027-SLT

When it comes to making money, you can't go wrong with an original. And now, with the special merchandising feature of slanted rollers, an original has gotten even better. Operators will tell you Nemco—the original hot dog roller grill—has always been famous for its superior diehard cooking performance. Its time-tested, maintenance-free design will serve you for years and forever satisfy your customers with the tastiest, juiciest hot dogs. 360° roller rotation prevents residue buildup, while individual roller heating elements ensure heating consistency. Removable drip pan makes for easy cleaning. Requires no ventilation system. Seven heat settings offer versatile temperature control. Front and rear rollers have their own heat controls. This feature permits shutting off one section during non peak hours. *GripsIt*—this coating makes clean up easy for those sugary-coated, non-hot dog products and breakfast items.

Standard Features:

- Rugged stainless steel and aluminum construction
- Simplest installation – plugs into any outlet with corresponding voltage
- Rollers available in either standard chrome or *GripsIt* which cleans easily with just a damp sponge
- Two individual heat controls for front and rear rollers
- Temperature control with seven heat settings
- Roller grills slant 7° for effective merchandising
- Individual heating element in each roller with superior temperature consistency from end to end
- Sealed motor with ball bearings to prevent grease leakage out of motor
- Rollers rotate at a complete 360° turn by means of roller sprocket, motor sprocket and chain
- End bearing and grease barrier double protect against grease seepage
- Removable grease drip pan
- Preheat time is 20 minutes
- Full one year factory warranty
- NSF listed and cETLus listed

Accessories:

- Food Safety Guards available for all roller grills; offers sanitary protection
- Heated and humidified Bun Warmers keep buns fresh and ready to serve
- Bun boxes come in a variety of sizes for great merchandising
- Stainless steel Condiment Bars and Stations provide a neat and efficient way to provide condiments

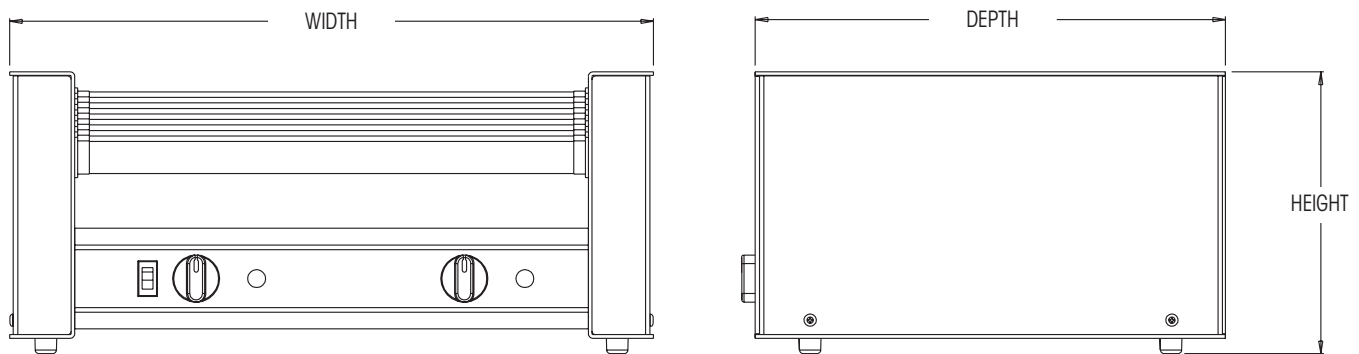


NEMCO Food Equipment, Ltd.
301 Meuse Argonne
P.O. Box 305
Hicksville, OH 43526
Phone (419) 542-7751
FAX (419) 542-6690
www.nemcofoodequip.com

Model Nos.

Chrome 8027-SLT 8036-SLT 8045W-SLT

GripsIt 8027SX-SLT 8036SX-SLT 8045SXW-SLT



Specifications:

Model No.	Hot Dog Capacity	Width Inches/(cm)	Depth Inches/(cm)	Height Inches/(cm)	Voltage	Wattage	Nominal Amps	# of Cords NEMA Configuration	Unit Weight bs./(kg.)	Shipping Weight lbs./(kg.)
8027-SLT, 8027SX-SLT	27	22 1/4 (56.5)	16 1/4 (41.3)	10 1/4 (26.0)	120	950	7.9	(1)5-15 plug	37 (16.8)	44 (20.0)
8027-SLT-220, 8027SX-SLT-220	27	22 1/4 (56.5)	16 1/4 (41.3)	10 1/4 (26.0)	220	950	4.3	(1)6-15 plug	37 (16.8)	44 (20.0)
8036-SLT, 8036SX-SLT	36	29 1/2 (74.9)	16 1/4 (41.3)	10 1/4 (26.0)	120	1500	12.5	(1)5-15 plug	48 (21.8)	55 (23.6)
8036-SLT-220, 8036SX-SLT-220	36	29 1/2 (74.9)	16 1/4 (41.3)	10 1/4 (26.0)	220	1500	6.8	(1)6-15 plug	48 (21.8)	55 (23.6)
8045W-SLT, 8045SXW-SLT	45	35 1/2 (90.2)	16 1/4 (41.3)	10 1/4 (26.0)	120	1800	15	(1)5-15 plug	54 (24.5)	63 (28.2)
8045W-SLT-220, 8045SXW-SLT-220	45	35 1/2 (90.2)	16 1/4 (41.3)	10 1/4 (26.0)	220	1800	8.2	(1)6-15 plug	54 (24.5)	63 (28.2)

(SX) Denotes special non-slip *GripsIt* coating

Typical Specifications

Roller Grill shall be stainless steel and heavy-duty aluminum construction and use a non slip *GripsIt* or chrome rollers and tubular heating elements. Rollers slant from front to rear of unit by 7° for effective merchandising. One element shall be contained in each roller. Seven setting infinite temperature control provides flexible cooking and holding. Unit shall have a sealed motor with ball bearings for long life. Each roller shall have a PTFE end bearing and FEP grease barrier combination. The unit shall be equipped with a pilot light, lighted rocker switch and operate on 120V (60Hz) with (1) or (2) 6' cord (s) and NEMA 5-15P, 5-20P, on 220V (60Hz) with a 6' cord and NEMA 6-15P, NEMA 6-15P, or on 230V (50Hz) with a 6' cord and SCHUKO CEE7-7. Roller grills shall carry the approval of cETLus (120V, 220V), shall be listed with the National Sanitation Foundation (120V), and shall carry the approval of CE (230V).



Made in U.S.A.



NEMCO Food Equipment, Ltd.
301 Meuse Argonne, P.O. Box 305
Hicksville, OH 43526
Phone (419) 542-7751
FAX (419) 542-6690
www.nemcofoodequip.com





Item No. _____

Quantity _____

Model No.

8018-BW, 8027-BW, 8036-BW, 8045N-BW, 8045W-BW, 8075-BW

MOIST HEAT BUN/FOOD WARMERS

8024-BW, 8048-BW

BUN/FOOD WARMERS8018-SBB, 8027-SBB, 8036-SBB, 8045W-SBB, 8045N-SBB,
8075-SBB, 8230-SBB, 8250-SBB, 8027-BWNH**STAINLESS STEEL BUN BOXES**

8027-BW

8024-BW



8048-BW

8045W-SBB

**MOIST HEAT BUN/FOOD WARMERS**

Keep your buns fresh and tasty with Nemco's line of moist heat bun / food warmers! This unit will warm it, store it and sell it! They're great for holding buns or even buns with hotdogs. And they're manufactured to the high quality you are used to from Nemco! With several different sizes designed to fit beneath the Nemco Roller grill models, they make a very profitable addition to your operation.

Standard Features:

- Stainless steel construction
- Stainless steel rack in bottom of pan to separate buns from water
- Adjustable thermostat up to 200°F
- Easy open sliding drawer
- Fits under Roller Grill to maximize counter space

BUN / FOOD WARMERS

Whether you need capacity for two or four dozen buns, these durable, stainless steel, single-drawer warmers **without a water reservoir** will keep the buns and other foods fresh and ready to serve. Their space-saving, stackable design makes for an easy fit anywhere. 8024-BW has a stainless steel flip door.

Standard Features:

- Stainless steel construction
- Temperature of the **8024-BW reaches 100°F** and 8048-BW reaches 150°F
- Fits under Roller Grill to maximize counter space

STAINLESS STEEL BUN BOXES

Each of these commercial-grade boxes provides a durable, stackable storage unit that keeps your hot dog buns fresh (leave buns in bag). They are designed to accommodate the appropriate size roller grill for maximum countertop efficiency.

Standard Features:

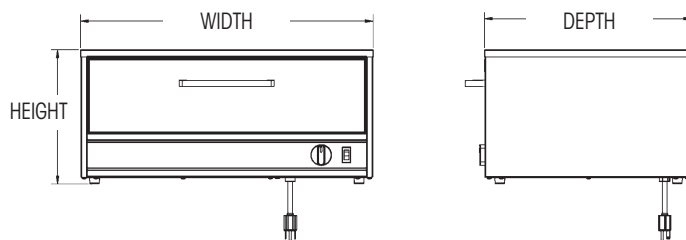
- Stainless steel construction
- Polycarbonate hinged doors
- Fits under Roller Grill to maximize counter space



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Model No.

8018-BW 8027-BW 8036-BW 8045W-BW 8045N-BW 8075-BW
 8024-BW 8048-BW
 8018-SBB 8027-SBB 8036-SBB 8045W-SBB 8045N-SBB 8075-BW 8230-SBB 8250-SBB 8027-BWNH



Specifications - Moist Heat Bun/Food Warmers

Model No.	Fits Grill Model	Bun Capacity	Preheat Time	Width Inches/(cm)	Depth Inches/(cm)	Height Inches/(cm)	Volts	Rated Wattage	Nominal Amps	NEMA Plug	Actual Weight lbs./ (kg)	Shipping Weight lbs./ (kg)
8018-BW 8018-BW-220	8018	24	15	18 1/2" (47.0)	17 1/2" (44.5)	10 5/8" (27.0)	120 220	400 400	3.3 1.8	5-15 P 6-15 P	37 (16.8)	45 (20.5)
8027-BW 8027-BW-220	8027	32	15	23 3/4" (60.3)	17 3/4" (45.1)	10 5/8" (27.0)	120 220	450 450	3.8 2.0	5-15 P 6-15 P	45 (20.5)	52 (23.7)
8036-BW 8036-BW-220	8036	48	15	30" (76.2)	17 1/2" (44.5)	10 5/8" (27.0)	120 220	550 550	4.6 2.5	5-15 P 6-15 P	56 (25.5)	64 (29.0)
8045W-BW 8045W-BW-220	8045W	64	15	35 1/2" (90.2)	17 1/2" (44.5)	10 5/8" (27.0)	120 220	650 650	5.4 3.0	5-15 P 6-15 P	63 (29.7)	72 (32.8)
8045N-BW 8045N-BW-220	8045N	32	15	23 3/4" (60.3)	26 3/4" (67.9)	10 5/8" (27.0)	120 220	450 450	3.8 2.0	5-15 P 6-15 P	49 (22.3)	60 (27.3)
8075-BW 8075-BW-220	8075	64	15	35 1/2" (90.2)	25 (63.5)	10 5/8" (27.0)	120 220	650 650	5.4 3.0	5-15 P 6-15 P	71 (32.3)	84 (38.2)

Specifications - Bun/Food Warmers

Model No.	Fits Grill Model	Bun Capacity	Preheat Time	Width Inches/(cm)	Depth Inches/(cm)	Height Inches/(cm)	Volts	Rated Wattage	Nominal Amps	NEMA Plug	Actual Weight lbs./ (kg)	Shipping Weight lbs./ (kg)
8024-BW 8024-BW-220	8010	24	30	15 3/4" (40.0)	11" (27.9)	5" (12.7)	120 220	20	0.17 0.09	5-15 P 6-15 P	9 (4.1)	11 (5.0)
8048-BW 8048-BW-220	8027	48	30	22" (55.9)	15 1/4" (38.7)	7 1/2" (19.1)	120 220	108	0.9 0.5	5-15 P 6-15 P	27.5 (12.5)	33 (15.0)

Specifications - Bun Boxes

Model No.	Fits Grill Model	Bun Capacity	Width Inches/(cm)	Depth Inches/(cm)	Height Inches/(cm)	Actual Weight lbs./ (kg)	Shipping Weight lbs./ (kg)
8018-SBB	8018	36	18 3/4" (47.6)	19" (48.3)	6 1/4" (15.9)	9 (4.1)	12 (5.4)
8027-SBB	8027	36	22 3/4" (57.8)	19" (48.3)	6 1/4" (15.9)	14 (6.4)	19 (8.7)
8036-SBB	8036	48	29 5/8" (75.2)	19" (48.3)	6 1/4" (15.9)	15 (6.9)	20 (9.1)
8045W-SBB	8045W	60	35 1/2" (90.2)	19" (48.3)	6 1/4" (15.9)	17 (7.8)	23 (10.5)
8045N-SBB	8045N	64	22 1/4" (56.5)	28 1/4" (71.8)	6 1/4" (15.9)	15 (6.9)	20 (9.1)
8075-SBB	8075	96	35 1/2" (90.2)	28 1/4" (71.8)	6 1/4" (15.9)	18 (8.2)	26 (11.9)
8230-SBB	8230	36	23 3/4" (60.3)	21 1/4" (71.8)	6 1/4" (15.9)	15 (6.9)	20 (9.1)
8250-SBB	8250	60	35 3/4" (90.8)	21 1/4" (71.8)	6 1/4" (15.9)	17 (7.8)	23 (10.5)
8027-BWNH	8027	32	23 3/4" (60.3)	17 3/4" (44.5)	10 5/8" (27.0)	45 (20.5)	52 (23.7)

Typical Specifications

Moist heat bun/food warmers shall have stainless steel body, interior, bun drawer slides and pan and be equipped with a thermostatic control and metal sheath heating element. They also shall have a maximum heat setting of 200°F and shall operate on 120V and 220V. The bun/food warmers model # 8024-BW shall have a maximum heat setting of 100°F and the 8048-BW unit shall have a maximum heat setting 150°F. A 6' cord and plug shall be furnished for easy installation on all Moist Heat Bun/Food Warmers and Bun/Food Warmers. Moist heat bun/food warmers shall be ETL and National Sanitation Foundation listed. The Bun/Food Warmers shall be ETL and National Sanitation Foundation listed. The Bun Boxes shall be National Sanitation Foundation listed.



NEMCO Food Equipment, Ltd.
 301 Meuse Argonne Ave.
 Hicksville, OH 43526
 Phone 419-542-7751
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www.nemcofoodequip.com



Project _____

Item # _____

Quantity _____

Flav-R-Fresh® Impulse Display Cabinets

Models: FDWD-1, -1X, -2, -2X

The Hatco Flav-R-Fresh® uses controlled moisture and heat to showcase your product longer, not just for minutes but for hours. It holds everything from hot pretzels to 15" (381 mm) pizzas, croissants to bagels, and even hot dogs and meat pies.

Electrical components, controls and water reservoir are located at the top for easy access. Electronic controls monitor cabinet temperature. Models with two doors are available for pass-through convenience and a variety of merchandising racks help enhance food appeal.

The Hatco Flav-R-Fresh is ideal for restaurants, pizzerias, convenience stores, concession stands, snack bars and kiosks.

Standard features

- Energy efficient LED lighting showcases your food appeal while safe-guarding food products from bulb breakage
- Separate heat and humidity controls keep crisp foods crisp and moist foods moist
- The rounded designed cabinet features tempered glass sides and door for full-view display
- Single- or double-side opening models
- Specify left- or right-hinged door at time of order, and doors are field reversible (excludes self-closing door)

WATER QUALITY REQUIREMENTS

Water supply in excess of 3.0 grains of hardness per gallon (GPG) (.75 grains of hardness per liter) must be treated and softened before being used. Water containing over 3.0 GPG (.75 GPL) will decrease the efficiency and reduce the operating life of the unit.

Note: Product failure caused by liming or sediment buildup is not covered under warranty.



IFS anti-microbial coatings use naturally-occurring, environmentally sustainable, silver ions to help inhibit the growth of microbes on the powder coated surface. See www.hatcocorp.com/antimicrobial-paint for more information.



For operation, location and safety information, please refer to the Installation and Operating Manual.



FDWD-1
accessory 4-tier circle
rack and rack coupling

Options (available at time of purchase only)

Designer Colors

Non-standard colors are non-returnable –

Clear Anodized Aluminum standard –

- Warm Red Black Gray Granite White Granite
- Navy Blue Hunter Green Antique Copper

Neutral White (cool) LED lighting (Warm White is standard)

Self-Closing Door in lieu of standard door. Left hinge only, not field reversible

6" Merchandising Display Sign Holder (control side only) (sign not included)

3" One Sided Merchandising Display Sign Holder (one per side, three max) (sign not included)

6 3/8" One Sided Merchandising Display Sign Holder (one per side, three max) (sign not included)

Accessories

4" (102 mm) Adjustable Legs

Motorless Rack Coupling (FDWD-1X -2X only)

4-tier Circle Rack (Requires coupling for -1X and -2X models)

4-shelf Multi-Purpose Rack

3-tier Pretzel Tree (Requires coupling for -1X and -2X models)

3-shelf Angle Rack

Decorative Kit:

Two Inset Side Panels

(Non-standard colors are non-returnable – Designer Black standard)

- Crescent Wave

Curved Header

(Non-standard colors are non-returnable – Designer Black standard)

- Hinged for control side Non-hinged for non-control side

Base Skirts (requires 4" [102 mm] adjustable legs, not included)

(Non-standard colors are non-returnable – Designer Black standard)

- Flat front, back and sides Curved front, flat back and sides
- Curved front and back, flat sides



HATCO CORPORATION | P.O. Box 340500 Milwaukee, WI 53234-0500 U.S.A. | (800) 558-0607 | (414) 671-6350

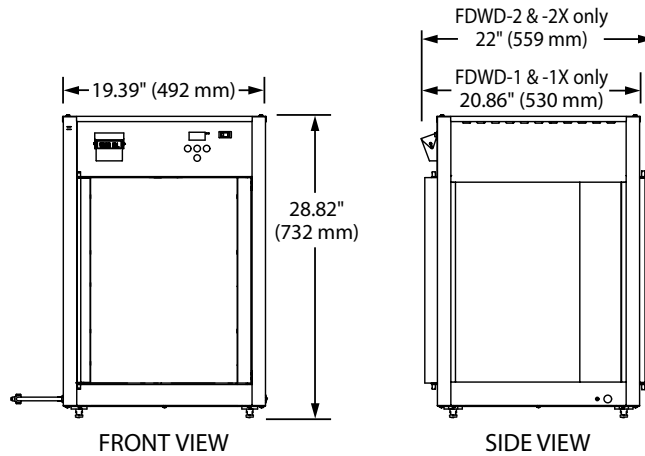


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Flav-R-Fresh® Impulse Display Cabinets

Models: FDWD-1, -1X, -2, -2X



SPECIFICATIONS Impulse Display Cabinets

The shaded areas contain electrical information for International models

Model ^o	Type	Dimensions (W x D x H*)	Volts	Watts	Amps	Plug	Ship Weight*
FDWD-1	1 Door with 4-tier Circle Rack with motor	19.39" x 20.86" x 28.82" (492 x 530 x 732 mm)	100	1410	14.1	NEMA 5-15P	90 lbs. (41 kg)
			120	1360	11.3	NEMA 5-15P	
			220	1410	6.4	CEE 7/7 Schuko or BS-1363	
			240	1410	5.9	CEE 7/7 Schuko or AS 3112	
			220 (CE)	1410	6.4	CEE 7/7 Schuko	
			240 (CE)	1410	5.9	BS-1363	
FDWD-1X	1 Door with 4-shelf Multi-Purpose Rack without motor (not available for retrofit)	19.39" x 20.86" x 28.82" (492 x 530 x 732 mm)	100	1440	14.4	NEMA 5-15P	90 lbs. (41 kg)
			120	1360	11.3	NEMA 5-15P	
			220	1440	6.5	CEE 7/7 Schuko or BS-1363	
			240	1440	6.0	CEE 7/7 Schuko or AS 3112	
			220 (CE)	1410	6.4	CEE 7/7 Schuko	
			240 (CE)	1410	5.9	BS-1363	
FDWD-2	2 Doors with 4-tier Circle Rack with motor	19.39" x 22" x 28.32" (492 x 559 x 727 mm)	100	1410	14.1	NEMA 5-15P	90 lbs. (41 kg)
			120	1360	11.3	NEMA 5-15P	
			220	1410	6.4	CEE 7/7 Schuko or BS-1363	
			240	1440	5.9	CEE 7/7 Schuko or AS 3112	
			220 (CE)	1410	6.4	CEE 7/7 Schuko	
			240 (CE)	1410	5.9	BS-1363	
FDWD-2X	2 Doors with 4-shelf Multi-Purpose Rack without motor (not available for retrofit)	19.39" x 22" x 28.32" (492 x 559 x 727 mm)	100	1410	14.1	NEMA 5-15P	90 lbs. (41 kg)
			120	1360	11.3	NEMA 5-15P	
			220	1410	6.4	CEE 7/7 Schuko or BS-1363	
			240	1440	5.9	CEE 7/7 Schuko or AS 3112	
			220 (CE)	1410	6.4	CEE 7/7 Schuko	
			240 (CE)	1410	5.9	BS-1363	

^o Non-humidified cabinets available, unit will only operate in dry mode.
 * Height includes standard 1" (25 mm) legs.
 * Shipping weight includes packaging.

CABINET OPENING

15.75"W x 19.75" H (400 x 502 mm). Will fit half size sheet pans.

CORD LOCATION

Facing controls, left-hand side panel, lower right corner.

PRODUCT SPECS Impulse Display Cabinets

The humidity controlled Impulse Display Cabinet shall be a Flav-R-Fresh® Model ... rated at ... volts and ... watts, as manufactured by the Hatco Corporation, Milwaukee, WI 53234 U.S.A.

The cabinet shall have ... door(s), tempered glass sides, stationary rack (or revolving display), and LED display light. It shall include a water reservoir, electronic controls,

PLUG CONFIGURATIONS



On/Off switch, and indicating lights. A 6' (1829 mm) cord with plug shall be attached.

Accessories shall include merchandising racks, display sign holders (signs not included) and side, top and base skirt.

Warranty consists of 24/7 parts and service assistance (US and Canada only).

HATCO CORPORATION | P.O. Box 340500 Milwaukee, WI 53234-0500 U.S.A. | (800) 558-0607 | (414) 671-6350

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Item No. _____

Quantity _____

nemco®

 | FOOD EQUIPMENT

Model No.

6450, 6450-4, 6451, 6451-2,
6452, 6452-2, 6453, 6453-2,
6454, 6454-2, 6455, 6455-2
**PIZZA, PRETZEL & HOT
FOOD MERCHANDISERS**



6451



6453



6454

Powerful, attractive NEMCO Merchandisers stimulate added sales of your fresh pizza, pretzels, bagels, muffins, etc. Choose from either 3 or 4 tiered rack models ideal for holding and displaying your product in a controlled temperature environment. Both single and double door units are available with fixed or rotating shelves. Durable stainless steel construction and tempered glass makes clean-up quick and easy. All units come with lighted interiors, contemporary signage, and a water reservoir to provide humidity. Exclusive to Nemco, the new and improved "break-away" clutch motor design allows end users to turn the rack in either direction to reach the desired product while the door is open.

Standard Features:

- Stainless steel and tempered glass construction
- Water reservoir
- Tubular heating element
- Bulb and capillary adjustable thermostat
- Temperature gauge on control panel
- Rack stops when door opens
- Rack motor has exclusive "break-away" clutch feature
- 2 - 40 watt interior lights
- Served and Self Serve models
- "Power-on" Indicator light
- 4" adjustable feet
- 120 Volt
- ETL and NSF listed

Accessories:

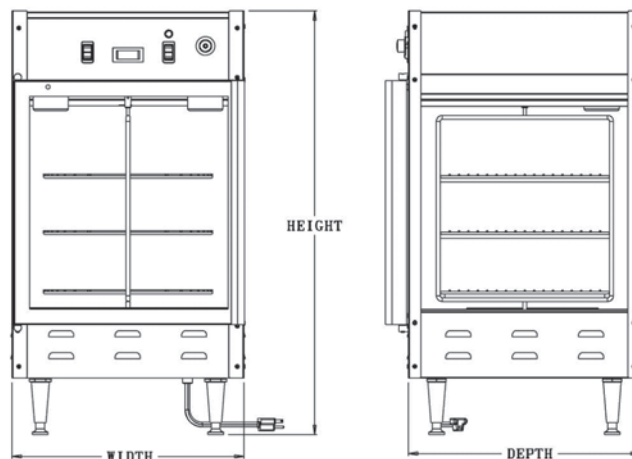
- Set of four stainless steel legs
- Replacement Racks



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Model No.

**6450, 6450-4, 6451, 6451-2, 6452, 6452-2,
6453, 6453-2, 6454, 6454-2, 6455, 6455-2**

**Specifications**

Model No.	Time to 180°	Width Inches/ (cm)	Depth Inches/ (cm)	Height Inches/ (cm)	Rack Size	Voltage	Rated Wattage	Nominal Amps	NEMA Configuration	Unit Weight lbs./ (Kg)	Shipping Weight lbs./ (Kg)
6450	16 min.	18 1/2 (44.4)	18 1/2 (44.4)	33 7/8 (86.1)	3-Tier 12" Racks	120	1480	12.3	5-15P plug	66 (30.0)	76 (34.6)
6450-4	16 min.	18 1/2 (44.4)	18 1/2 (44.4)	33 7/8 (86.1)	4-Tier 12" Racks	120	1480	12.3	5-15P plug	66 (30.0)	76 (34.6)
6451, 6451-2	16 min.	22 1/4 (56.6)	22 1/4 (56.6)	33 7/8 (86.1)	3-Tier 18" Racks	120	1480	12.3	5-15P plug	83 (37.8)	93 (42.3)
6452, 6452-2	16 min.	22 1/4 (56.6)	22 1/4 (56.6)	33 7/8 (86.1)	4-Tier 18" Racks	120	1480	12.3	5-15P plug	83 (37.8)	93 (42.3)
6453, 6453-2	16 min.	22 1/4 (56.6)	22 1/4 (56.6)	33 7/8 (86.1)	16 Pretzel Arms	120	1480	12.3	5-15P plug	83 (37.8)	93 (42.3)
6454, 6454-2	16 min.	18 1/2 (44.4)	18 1/2 (44.4)	33 7/8 (86.1)	3-15" Square Shelves	120	1480	12.3	5-15P plug	66 (30.0)	76 (34.6)
6455, 6455-2	16 min.	22 1/4 (56.6)	22 1/4 (56.6)	33 7/8 (86.1)	3-19" Square Shelves	120	1480	12.3	5-15P plug	83 (37.8)	93 (42.3)

* "-2" models are self serve with two doors.

TYPICAL SPECIFICATIONS

Merchandisers shall be constructed with a brushed stainless steel frame and tempered glass sidewall panels. The interior shall have a water reservoir for maintaining moisture. All units will have case vents, contemporary, stylish signage, 4" legs, 2 – 40 W oven lamps, and a 6' cord and NEMA 5-15P plug. Each unit shall have a 1400 W tubular heating element, separate rocker switches for the interior lights and heating element, light indicating cycling of heating, a bulb and capillary adjustable thermostat, and "break-away" clutch motor. The units shall operate on 120 volts and be rated at 1480 watts. The merchandisers shall carry the approval of ETL Testing Laboratories and shall be listed with the National Sanitation Foundation.



SILVER SCREEN

PROFESSIONAL POPCORN MACHINES

The Silver Screen Professional Popcorn Machines are our most technically advanced models. These models incorporate a separate cabinet thermostat and temperature indicator. This Benchmark USA innovation allows you to accurately control the heat in the food zone ensuring that your popcorn is always at the perfect serving temperature. Each Silver Screen model has a stainless steel cabinet and food zone insuring years of durability. The Silver Screen Poppers utilize a hard-coat anodized, high Thermal Mass Kettle for easy cleaning and superior performance. The four-switch configuration allows for any operating situation. They are available in a space saving 8 ounce model and a high production 14 ounce model. Either model will work on a standard 15 amp circuit so that it can be used anywhere without any additional electrical wiring. Optional stainless steel pedestal bases with heavy-duty casters and storage capabilities are available for either model.



Silver Screen 14 with Optional Pedestal Base

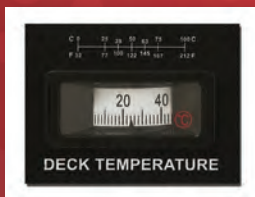
- Stainless Steel Cabinet & Food Zone
- Thermostatically Controlled Serving Temperature
- Four-Switch Operation
- Operates on a 15 Amp Circuit
- Optional Stainless Steel Pedestal Bases
- Old Maid Drawer for Kernels
- Anodized, High-Thermal Mass Kettles for Easy Cleaning and Superior Performance
- Presentation Lamp for Interior Lighting



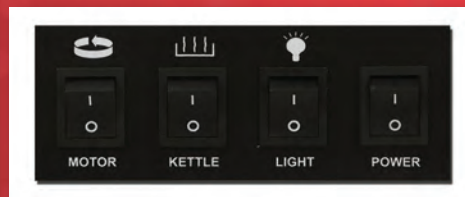
Silver Screen 14 Popper



Thermostatically Controlled Serving Temp



Cabinet Temp Indicator



Four Switch Operation



Old Maid Drawer



Pedestal Storage

Ideal For:

- Schools & Churches
- Concession Stands
- Theaters
- Cafeterias
- Zoos
- Stadiums & Arenas

Part #	Model	Description	Volts	Watts	Amps	Qts./Hr.	Dimensions	Wt.
11087	Silver Screen 8	8 oz. Popcorn Machine	120	1510	12.6	170	20"w x17"d x30"h	61#
11147	Silver Screen 14	14 oz. Popcorn Machine	120	1760	14.7	297	24"w x19"d x36"h	85#
30087	SS8 Pedestal	Stainless Steel Base for 8 oz	-	-	-	-	20"w x17"d x33"h	62#
30147	SS14 Pedestal	Stainless Steel Base for 14 oz	-	-	-	-	24"w x20"d x33"h	73#



New Jersey: 888-946-2682
Florida: 786-536-4656
California: 888-946-2652

S.G. Nesbitt Concession Stand



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Page: 31

PREMIERE™ POPCORN MACHINES

"Premiere" flavorful popped corn in big-screen style.

- ◆ Easy to use, simple two-switch operation
- ◆ Built-in heated warming deck and warmer light (bulb not included)
- ◆ Old-maid drawer catches unpopped kernels
- ◆ Stainless steel food-zone for easy cleaning
- ◆ Thick 20 mil non-stick coated popping kettle
- ◆ Tempered glass panels on front and side
- ◆ Clear plexiglass doors at rear

ITEM	OVERALL DIMENSIONS L" X D" X H" (mm)	POWER	PLUG	SHIP WEIGHT
11048	18-1/2 x 14 x 26-1/2	120V-60Hz, 930W, 7.8A	NEMA 5-15P	47 lbs (21.3 kgs)
11068	(470 x 356 x 673)	120V-60Hz, 1130W, 9.4A		48 lbs (21.8 kgs)

ITEM	DESCRIPTION	UOM	CASE
11048	4 oz Kettle	Set	1
11068	6 oz Kettle	Set	1

PREMIERE™ PEDESTAL BASE

- ◆ 2" swivel casters for easy mobility
- ◆ Storage compartment with interior shelf

ITEM	DESCRIPTION	UOM	CASE
30080	Pedestal Base for Premiere Popcorn Machines 19"W x 14"D x 32" h	Set	1

BENCHMARK USA™**POPCORN MACHINES**

30080
Pedestal only



11048
11068

SILVER SCREEN™ POPCORN MACHINES

"Silver Screen" is simple in looking and is technically savvy. A separate cabinet thermostat and temperature indicator accurately controls the heat, ensuring that your popcorn is always at the perfect serving temperature.

- ◆ Stainless steel cabinet and food-zone
- ◆ Thermostatically controlled serving temperature
- ◆ Four-switch configuration allows for any operating situation
- ◆ Built-in warmer light (bulb not included)
- ◆ Old maid drawer catches unpopped kernels
- ◆ Superior performance hard-coat anodized, high thermal popping kettle

ITEM	OVERALL DIMENSIONS L" X D" X H" (mm)	POWER	PLUG	SHIP WEIGHT
11087	20 x 17 x 30 (508 x 432 x 762)	120V-60Hz, 1510W, 12.6A	NEMA 5-15P	61 lb (27.7 kgs)
11147	24 x 19 x 36 (610 x 483 x 915)	120V-60Hz, 1760W, 14.7A	NEMA 5-15P NEMA 5-20P (Canada)	85 lb (38.6 kgs)

ITEM	DESCRIPTION	UOM	CASE
11087	8 oz Kettle	Set	1
11147	14 oz Kettle	Set	1

SILVER SCREEN™ PEDESTAL BASE

- ◆ 3" locking swivel casters for easy mobility
- ◆ Storage compartment with interior shelf

ITEM	DESCRIPTION	UOM	CASE
30087	8 oz Pedestal Base 20"W x 17"D x 33"H	Set	1
30147	14 oz Pedestal Base 24"W x 20"D x 33"H	Set	1



30087 / 30147
Pedestal only



11087
11047

heated food merchandiser

models : GS1400-16, GS1400-16-2 &
GS1400-25, GS1400-25-2



FUNCTIONAL FEATURES

- Adjustable thermostat
- Temperatures from 80°F to above 150°F

CONSTRUCTION FEATURES

- Acrylic display
- Stainless steel corners and base
- 2-door "self-serve" option available
- Additional shelves available

Model GS1400-16:

- Available as single-door or 2-door pass through unit (GS1400-16-2)
- Total height of available shelf space: 14"
- Unit comes with 2 shelves

Model GS1400-25:

- Available as single-door or 2-door pass through unit (GS1400-25-2)
- Total height of available shelf space: 23"
- Unit comes with 4 shelves

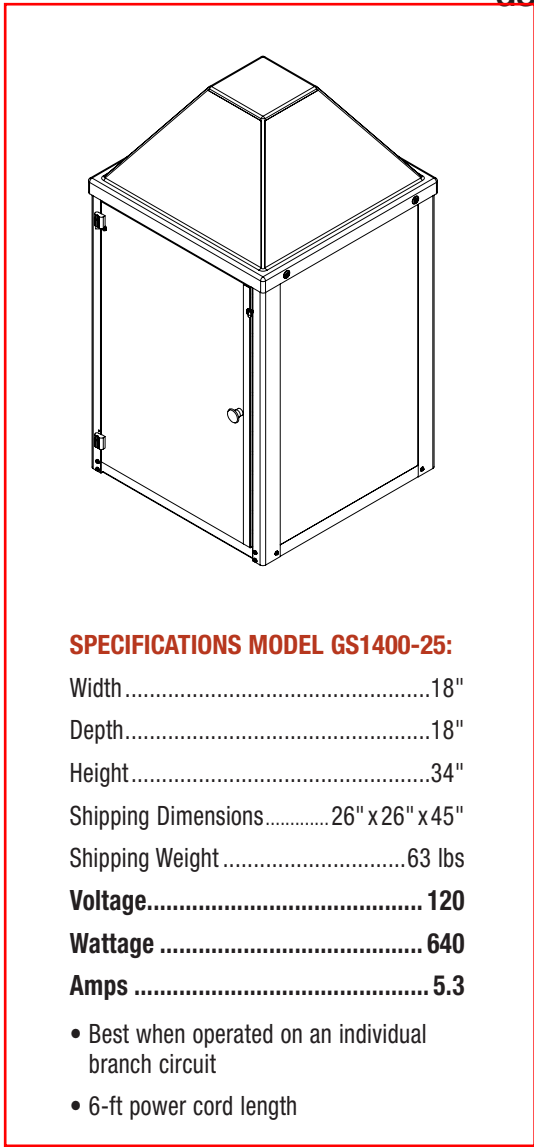
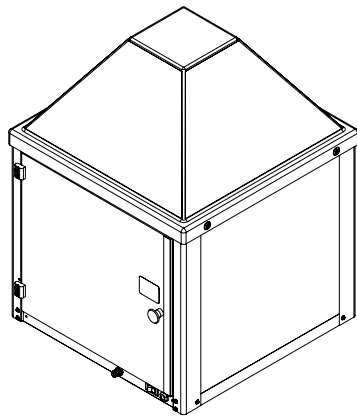
These warmers utilize circulating, heated air to maintain food above 150°F for extended periods of time. Their versatility is showcased with a shelving system that allows you to adjust the shelves to *your* specific needs resulting in an endless variety of food items it can accommodate.





heated food merchandiser

models : GS1400-16, GS1400-16-2 & GS1400-25, GS1400-25-2



SPECIFICATIONS MODEL GS1400-16:

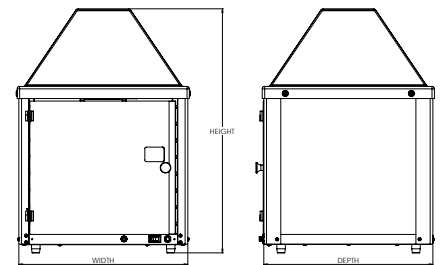
- Width18"
- Depth.....18"
- Height.....25"
- Shipping Dimensions.....24" x 24" x 32"
- Shipping Weight43 lbs
- Voltage..... 120**
- Wattage 640**
- Amps 5.3**

- Best when operated on an individual branch circuit
- 6-ft power cord length

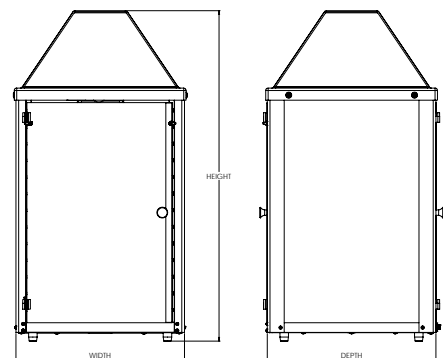
SPECIFICATIONS MODEL GS1400-25:

- Width18"
- Depth.....18"
- Height.....34"
- Shipping Dimensions.....26" x 26" x 45"
- Shipping Weight63 lbs
- Voltage..... 120**
- Wattage 640**
- Amps 5.3**

- Best when operated on an individual branch circuit
- 6-ft power cord length



MODEL GS1400-16



MODEL GS1400-25





Project _____
 Item # _____
 Quantity _____

Glo-Ray® Portable Foodwarmers

Models: GR-B, GRFF, GRFFL, GRFFB, GRFFBL

Hatco Glo-Ray® Portable Foodwarmers keep food hot at kitchen work areas, waitress pickup stations or customer serving points. Available in models and sizes to meet every food warming need.

Standard features

- Available with heat above the food, below the food, or both
- GR-B has a preset automatic thermostat to maintain proper base temperatures
- GRFF has a stand to keep food holding pans off the work area and allows easy access from three sides
- GRFFL models include two shatter resistant incandescent lights
- GRFFB's base conducts heat from the bottom while infrared elements heat from above
- GRFFB has a clearance of 12", 14", or 16" (305, 356, or 406 mm) between heated base and upper housing
- Hatco can custom design portable foodwarmers to meet customer specifications or to fit an unusual situation
- Factory pre-wired with a 6' (1829 mm) cord and plug



Options

- (available at time of purchase only)
- Designer Colors** – One color per unit, heated base is not powdercoated (not available on GR-B models)
- Warm Red Black Gray Granite White Granite
 - Navy Blue Hunter Green Antique Copper
- Gloss Finishes** – One color per unit, heated base is not powdercoated (not available on GR-B models)
- Gleaming Gold Glossy Gray Bold Black
 - Radiant Red Brilliant Blue
- 9"W x 5.5"H (229 x 140 mm) Display Sign Holder (Sign not included) (GRFFL model with back toggle only) adds 3" (76 mm) to height of unit
 - Infinite Control (not available on GR-B or units with sign holder)
 - Halogen Bulb

Accessories

- 5 Pleat Hardcoated French Fry Box Ribbon
 - 8 Pleat Hardcoated French Fry Bag Ribbon
 - Food Holding Pans
 - Wire Trivets
- ChefLED Bulb in lieu of Standard Display Light (60 watt) *excludes GR-B* –
- | | |
|---|--|
| <input type="checkbox"/> 120V | <input type="checkbox"/> 230V (CE for input voltages above 200V) |
| <input type="checkbox"/> CLED-2700-120 Warm light | <input type="checkbox"/> CLED-2700-230 Warm light |
| <input type="checkbox"/> CLED-3000-120 Warm light | <input type="checkbox"/> CLED-3000-230 Warm light |
| <input type="checkbox"/> CLED-4000-120 Cool light | <input type="checkbox"/> CLED-4000-230 Cool light |

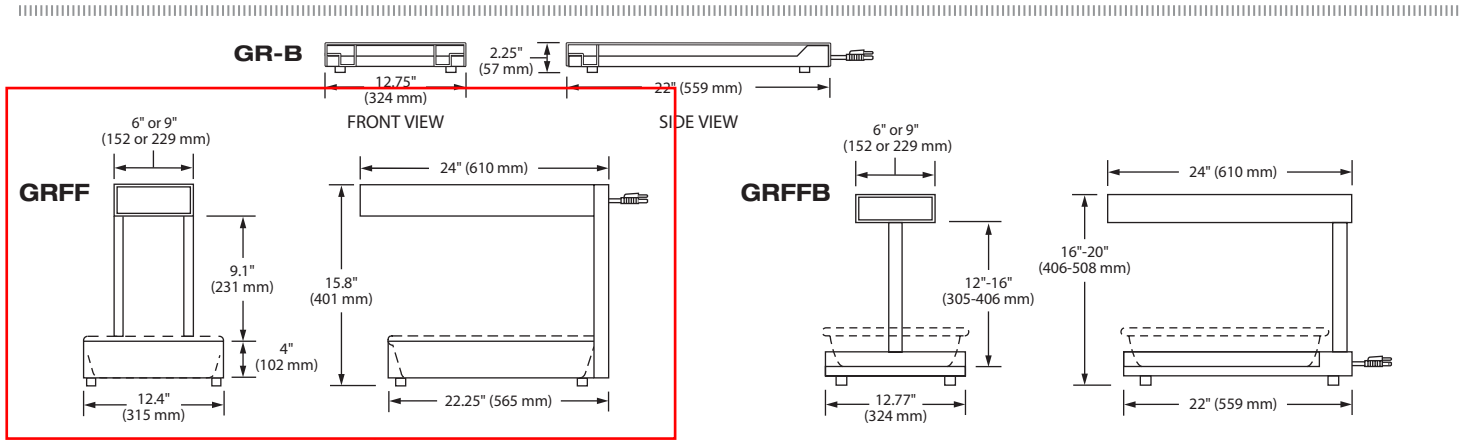
For operation, location and safety information, please refer to the Installation & Operating Manual.





Glo-Ray® Portable Foodwarmers

Models: GR-B, GRFF, GRFFL, GRFFB, GRFFBL



SPECIFICATIONS - Glo-Ray® Portable Foodwarmers

The shaded areas contain electrical information for International models only

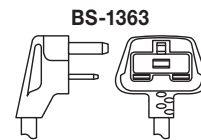
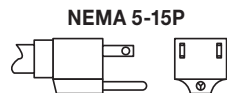
Model	Dimensions (Width x Depth x Height)	Volts	Phase	Watts	Amps	Plug	Ship Weight*
GR-B	12.75"x 22" x 2.25" (324 x 559 x 57 mm)	120	Single	250	2.1	NEMA 5-15P	14 lbs. (7 kg)
		220				CEE 7/7 Schuko	
		240		BS-1363			
		220-230 (CE)		210-230	1.0	CEE 7/7 Schuko	
		230-240 (CE)				BS-1363	
GRFF	12.4" x 24" x 15.8" (315 x 610 x 401 mm)	100	Single	500	5.0	NEMA 5-15P	14 lbs. (7 kg)
		120				NEMA 5-15P	
		220				CEE 7/7 Schuko	
		240		2.1	BS-1363		
		220-230 (CE)		500-546	2.3-2.4	CEE 7/7 Schuko	
230-240 (CE)	459-500	2.0-2.1	BS-1363				
GRFFL	12.4" x 24" x 15.8" (315 x 610 x 401 mm)	100	Single	584	5.8	NEMA 5-15P	14 lbs. (7 kg)
		120		620	6.5	NEMA 5-15P	
		220		600	5.6	CEE 7/7 Schuko	
		240		620	5.6	BS-1363	
		220-230 (CE)		600-656	6.1-6.4	CEE 7/7 Schuko	
230-240 (CE)	569-620	5.4-5.6	BS-1363				
GRFFB	12.75" x 24" x 16"-20" (324 x 610 x 406-508 mm)	100	Single	750	7.5	NEMA 5-15P	29 lbs. (13 kg)
		120		6.3	NEMA 5-15P		
		220		710	3.2	CEE 7/7 Schuko	
		240		750	3.1	BS-1363	
		220-230 (CE)		710-777	3.2-3.4	CEE 7/7 Schuko	
230-240 (CE)	689-750	3.1	BS-1363				
GRFFBL	12.75" x 24" x 16"-20" (324 x 610 x 406-508 mm)	100	Single	833	8.3	NEMA 5-15P	34 lbs. (14 kg)
		120		870	7.3	NEMA 5-15P	
		220		810	3.7	CEE 7/7 Schuko	
		240		870	3.6	BS-1363	
		220-230 (CE)		810-867	3.7-3.8	CEE 7/7 Schuko	
230-240 (CE)	799-870	3.6	BS-1363				

*Shipping weight includes packaging.

CORD LOCATION

GR-B, GRFFB, GRFFBL: Back, lower middle.
GRFF, GRFFL: Back, upper middle.

PLUG CONFIGURATIONS



PRODUCT SPECS Portable Foodwarmers

The Portable Foodwarmer shall be a Glo-Ray® manufactured by the Hatco Corporation, Milwaukee, WI 53234 U.S.A.

The Portable Foodwarmer shall be rated ... watts, ... volts, single phase and be ... inches (millimeters) in overall width.

The Glo-Ray shall consist of aluminum housing and include an infrared heating

element that shall be tubular metal sheathed. Optional shatter resistant incandescent display lights and heated base. Accessories shall include food holding pans, trivets, and ribbons.

Warranty consists of 24/7 parts and service assistance (U.S. and Canada only).

HATCO CORPORATION | P.O. Box 340500 Milwaukee, WI 53234-0500 U.S.A.
(800) 558-0607 | (414) 671-6350 | www.hatcocorp.com | support@hatcocorp.com



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California, Colorado, Florida, Georgia, Illinois,
Massachusetts, New Jersey, Ohio, Texas, Washington

Undercounter Refrigerators

Standard Features

- Stainless steel exterior & interior with reinforced stainless steel top
- Environmentally friendly R290 refrigerant
- Left hand hinge model available (MGF8401GRL)
- Electronic temperature controller
- Maintains temperatures between 33°F - 45°F
- Recessed door handle(s)
- Self-closing door(s) with stay open feature
- Magnetic door gasket(s) standard for positive door seal
- Pre-installed casters
- One(1) pre-installed shelf per section

Optional Accessories

- Extra shelves – includes 4 shelf clips per shelf
MGF8401GR(L) shelf part #: W0402568
MGF36RGR shelf part #: W0402713
MGF8402GR shelf part #: W0402171
MGF8403GR shelf part #: W0402569
MGF8404GR shelf part #: W0402171 left/right shelf, part #: W0402570 middle shelf

For the best results of food preservation we recommend setting your refrigerator between 33 °F to 45 °F

1. Don't forget to leave the unit some room to breathe!
2. Please clean the condenser frequently to give the unit more fresh air.

MODELS:

MGF8401GR / MGF8401GRL / MGF36RGR
MGF8402GR / MGF8403GR / MGF8404GR

MGF8401GR(L)



MGF36RGR



MGF8402GR



MGF8403GR



MGF8404GR



2 YEAR PARTS AND LABOR WARRANTY (US ONLY)
5 YEAR COMPRESSOR PART WARRANTY (US ONLY)



For confirmation and updates on the latest energy star models, please visit energystar.gov



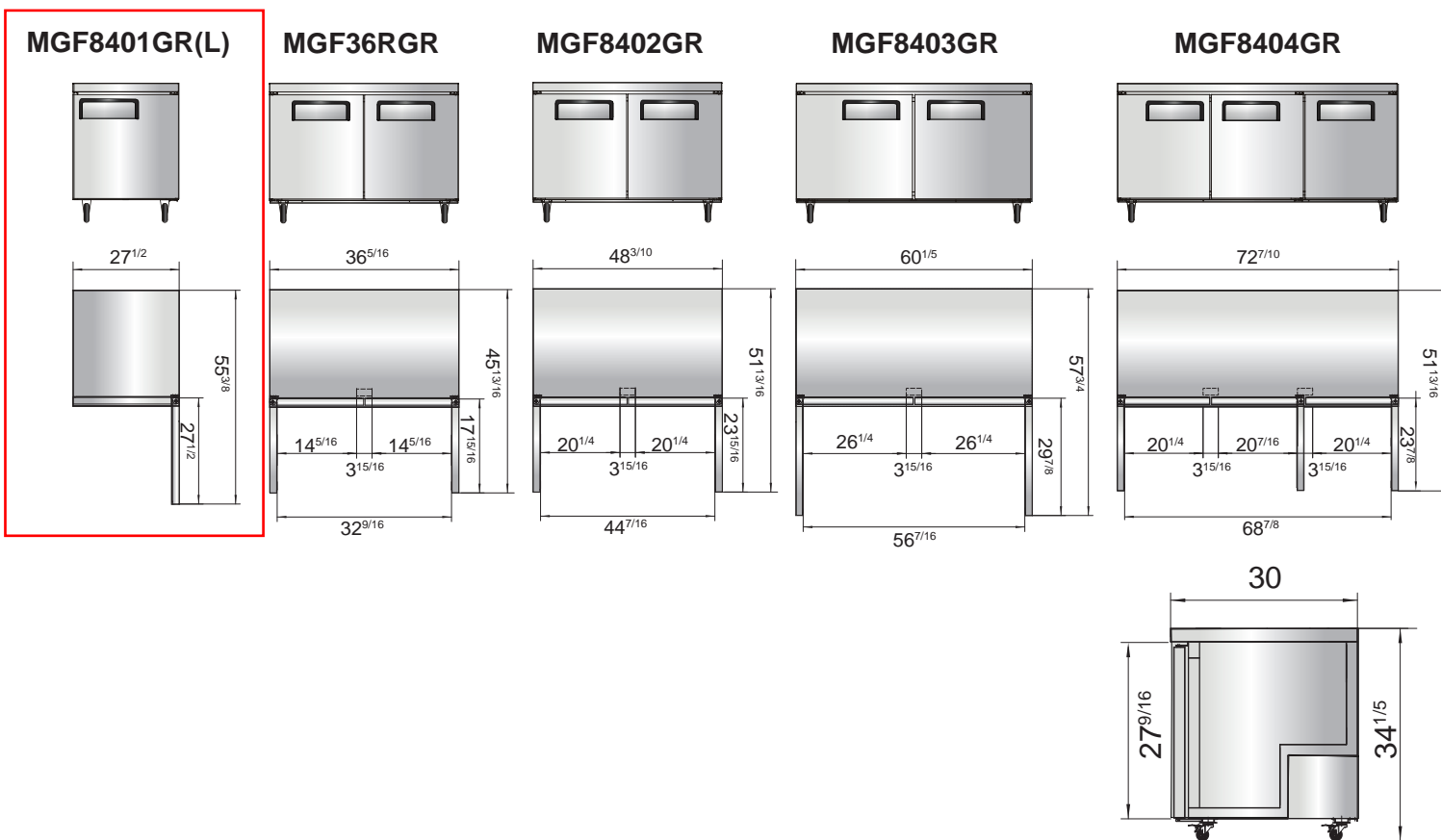
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 Massachusetts, New Jersey, Ohio, Texas, Washington

SPECIFICATIONS

Models	Door	Capacity (Cu.Ft.)	Shelves	Casters (inch)	Amps (A)	Voltage (V/Hz/Ph)	HP	Refrigerant	Exterior Dimensions (inch)	Net Weight (lbs)	Gross Weight (lbs)
MGF8401GR(L)	1	7.2	1	2	2.3	115/60/1	1/7	R290	27 ^{1/2} ×30×34 ^{1/5}	137	172
MGF36RGR	2	8.7	2	2	2.3	115/60/1	1/7	R290	36 ^{5/16} ×30×34 ^{1/5}	162	212
MGF8402GR	2	13.4	2	2	2.3	115/60/1	1/7	R290	48 ^{3/10} ×30×34 ^{1/5}	192	231
MGF8403GR	2	17.2	2	2	2.8	115/60/1	1/5	R290	60 ^{1/5} ×30×34 ^{1/5}	218	265
MGF8404GR	3	21.1	3	2	2.8	115/60/1	1/5	R290	72 ^{7/10} ×30×34 ^{1/5}	254	315

PLAN VIEW

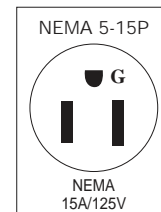


Casters

Epoxy shelves

Rear grate

Temperature control





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California, Colorado, Florida, Georgia, Illinois,
Massachusetts, New Jersey, Ohio, Texas, Washington

Undercounter Freezers

Standard Features

- Stainless steel exterior & interior with reinforced stainless steel top
- Environmentally friendly R290 refrigerant
- Left hand hinge model available (MGF8405GRL)
- Electronic temperature controller
- Maintains temperatures between -8°F – -1°F
- Recessed door handle(s)
- Self-closing door(s) with stay open feature
- Magnetic door gasket(s) standard for positive door seal
- Pre-installed casters
- One(1) pre-installed shelf per section

Optional Accessories

- Extra shelves – includes 4 shelf clips per shelf
MGF8405GR(L) shelf part #: W0402568
MGF36FGR shelf part #: W0402713
MGF8406GR shelf part #: W0402171

For the best results of food preservation we recommend setting your freezer between -8 °F to -1 °F

1. Don't forget to leave the unit some room to breathe!
2. Please clean the condenser frequently to give the unit more fresh air.

MODELS:

MGF8405GR / MGF8405GRL
MGF36FGR / MGF8406GR



MGF8405GR(L)



MGF36FGR



MGF8406GR



2 YEAR PARTS AND LABOR WARRANTY (US ONLY)
5 YEAR COMPRESSOR PART WARRANTY (US ONLY)





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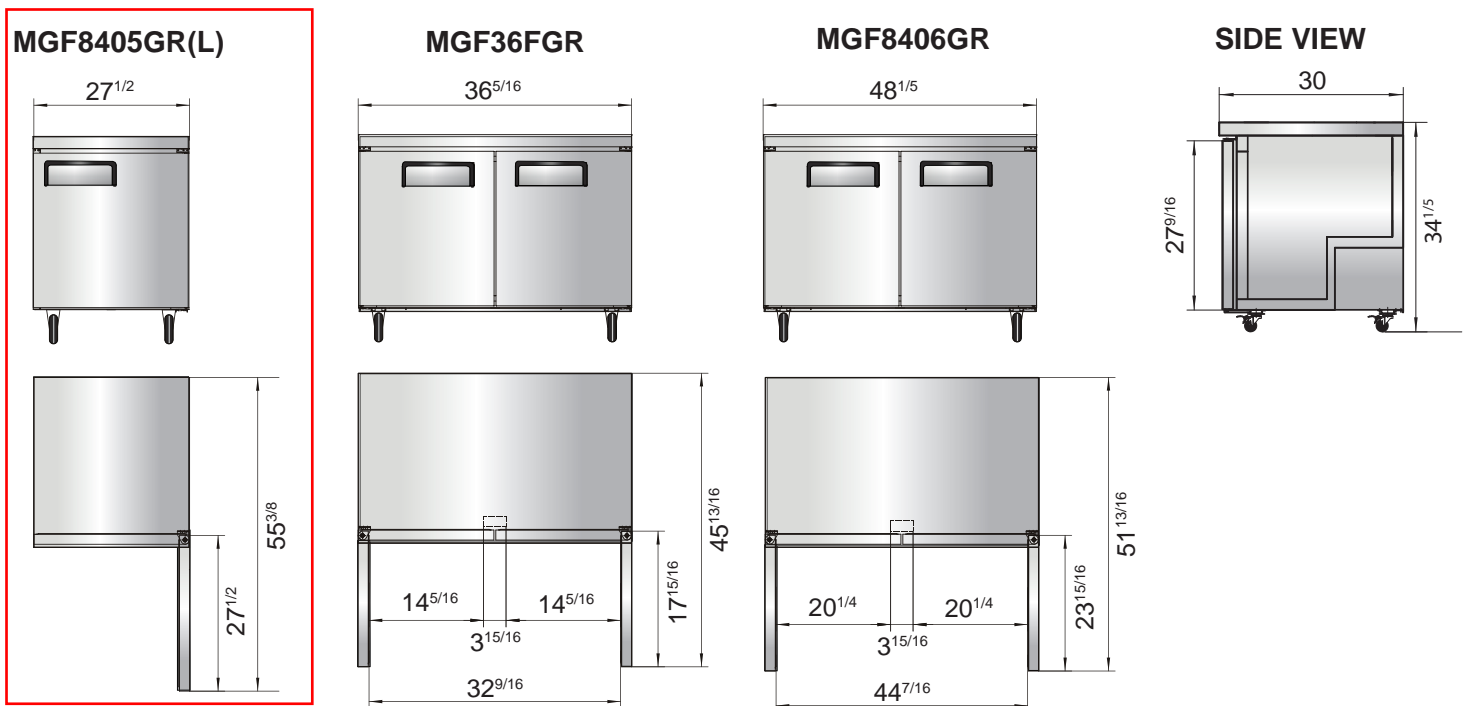
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California, Colorado, Florida, Georgia, Illinois, Massachusetts, New Jersey, Ohio, Texas, Washington

SPECIFICATIONS

Models	Door	Capacity (Cu.Ft.)	Shelves	Casters (inch)	Amps (A)	Voltage (V/Hz/Ph)	HP	Refrigerant	Exterior Dimensions (inch)	Net Weight (lbs)	Gross Weight (lbs)
MGF8405GR(L)	1	7.2	1	2	1.8	115/60/1	1/5	R290	27 ^{1/2} ×30×34 ^{1/5}	146	179
MGF36FGR	2	8.7	2	2	2.6	115/60/1	1/4	R290	36 ^{3/8} ×30×34 ^{1/5}	172	222
MGF8406GR	2	13.4	2	2	2.6	115/60/1	1/4	R290	48 ^{1/5} ×30×34 ^{1/5}	203	245

PLAN VIEW



Casters



Epoxy shelves



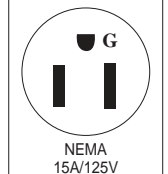
Rear grate



Temperature control



NEMA 5-15P



(905) 825-9665
 (802) 922-7025
(/sinks/compartment-sinks/P-cds3-18r-16)

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[Home](#) / [Sinks](#) / [Compartment Sinks](#) / [Compartment Sink, Triple, 75" x 27.5" x 36/47"](#)



Compartment Sink, Triple, 75" x 27.5" x 36/47"

CDS3-18R-16

Sink, 3-compartment, 75"W x 27"D x 45"H overall size, (3) 18"W x 21" front-to-back x 13" deep compartments, 18" right drainboard, 10"H backsplash, (1) set of splash mount faucet holes with 8" centers, 1-1/2" diameter bullnose edge on front & sides, (3) corner drains, includes (3) overflow tubes & (3) 8"H perforated drain guard assemblies, 16 gauge stainless steel construction, galvanized legs with side & rear bracing, adjustable bullet feet, cNSFus, KD

Dimensions: 75 " Length x 27.5 " Depth x 36/47 " Height

\$\$

Select Quantity:

(https://d37nkjg2y9adyq.cloudfront.net/850x850/tarrison-ecommerce/tarrison/sinks%2Fcompartment+sinks%2Fimages%2Fta-cds3-18r%2Fta-cds3-18r_1.jpg)

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Product Details

[SINKS/PSINKS/PSUBJECT=PRODUCT%20LINK&BODY=HTTPS://V](#)

Product Tags

[CDS3-](#) [CDS3-](#) [SINKS/P-](#)

[18R-](#) [18R-](#) [CDS3-](#)

[16\).](#) [16\).](#) [18R-](#)

[16\).](#)

LENGTH (Left to Right) : 75

DEPTH (Front to Back) : 27.5

Overall Height : 36/47

No of Compartments : 3

Drain Location : Corner

Working Height : 36

Drain Board : Right

Bowl Size : 21 x 18

* Actual Product may vary slightly from the image.



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VCS 2000 - Ventless Cooking Systems Ventless Fryers with Auto-Lift & Cabinet Base

MODELS WVAE55F WVAE55FC



WVAE55F/FC

DESCRIPTION

Wells Ventless Fryers are Certified Type-1 compliant, UL710B approved recirculation hood systems and feature completely self-contained air filtration and fire-suppression systems. They do not require venting outside making it possible to cook in non-traditional locations or when traditional Type-1 hoods and duct-work are impractical, restricted or too expensive. VCS models are integrated with hood and cooking equipment in one, ready to use package.

SPECIFICATIONS

Fire Protection – Completely self contained ANSUL® R-102 system includes ANSUL® tank, nitrogen cartridge, ANSUL® soprofanier, piping, fusible links, ANSUL® drops, nozzles, and movable manual pull station. Manual pull can be relocated to the egress position or an additional station can be added by an authorized ANSUL® representative. Fire protection system meets NFPA 96 Chapter 13. Fire protection system must be charged and certified by ANSUL® Authorized distributor after installation and before first use (operator's responsibility).

Filtration – Completely self-contained filtration process reduces emissions below that allowed in NFPA 96 and ANSI UL710B using the EPA 202 test method. Wells Ventless Fryers include a fully self-contained 3-stage air filtration system including a baffle filter with grease cup, a EPA (High- Efficiency Particulate Air) filter and a Carbon-Charcoal Filter. All filters are easily removable with out tools. Air flow sensors continually monitor air flow optimizing performance and grease removal while an interlock system will not allow cooking appliances to function if filters are missing, clogged or in the event of a fire.

Cooking Appliances – Cooking equipment is included and integrated in all VCS models. The WVAE55F and WVAE55FC provide high-production capacity in the narrowest footprint and include a paperless oil filtration system that reduces labor while cleaning oil more efficiently. All models feature Automatic Basket Lifts to maximize handling safety.

Exhaust and Air Flow – Exhaust air is vertical discharge. Typical airflow is 800 CFM. A minimum of 400 cubic feet of fresh air per minute is recommended both in and out of the cooking area to ensure the dilution of cooking aromas.

STANDARD FEATURES

- Completely self-contained, 3-stage filtration system
- Completely self-contained fire protection system
- Interlock system will disable cooking appliances if filters are missing, clogged or in the event of a fire
- Airflow sensors continually monitor airflow for optimizing performance and grease removal
- Illuminated early-warning system to monitor filter replacement
- Completely self-contained filtration process reduces emissions below that allowed in NFPA 96 and ANSI UL710B using the EPA 202 test method
- Stainless steel construction for strength, durability and ease of cleaning
- Fits through a 36" wide door opening
- Automatic Basket lift-cradle raises basket at the end of the cooking cycle for maximum safety and energy savings
- Paperless filtration system reduces labor, cleans oil more efficiency and extends oil life
- Repeat-cycle timer activates system using one push button operation
- Stainless steel, low-watt density, flat-bar elements provide longer oil life
- Automatic oil temperature control ensures precise temperatures while minimizing energy consumption
- WVAE55F and WVAE55FC feature a rectangular fry pot constructed of heavy duty stainless steel
- All models feature an additional fusible link on the frypot for added fire protection
- WVAE55FC includes solid state programmable time and temperature controls for a variety of menu items
- WVAE55F is available in 208V or 240V, 3Ø only @ 17KW
- WVAE55FC is available in 208V or 240V, 1 Ø or 3Ø. 1Ø phase models @ 11.3 KW and 3Ø models @ 17 KW

OPTIONS & ACCESSORIES

- High Efficiency Filter #22402
- Carbon-Charcoal Filter #22403
- Rear Leg Kit (set of 2) to be used with remote fire pull station #22692
- Full Size Basket for WVAE55F/FC #22913
- Half-Size Fry Basket for WVAE55F/FC # 22796
- Element cleaning brush, fry pot cleaning brush, Flavor Savor Oil Powder and Chicken stirring paddle

CERTIFICATIONS



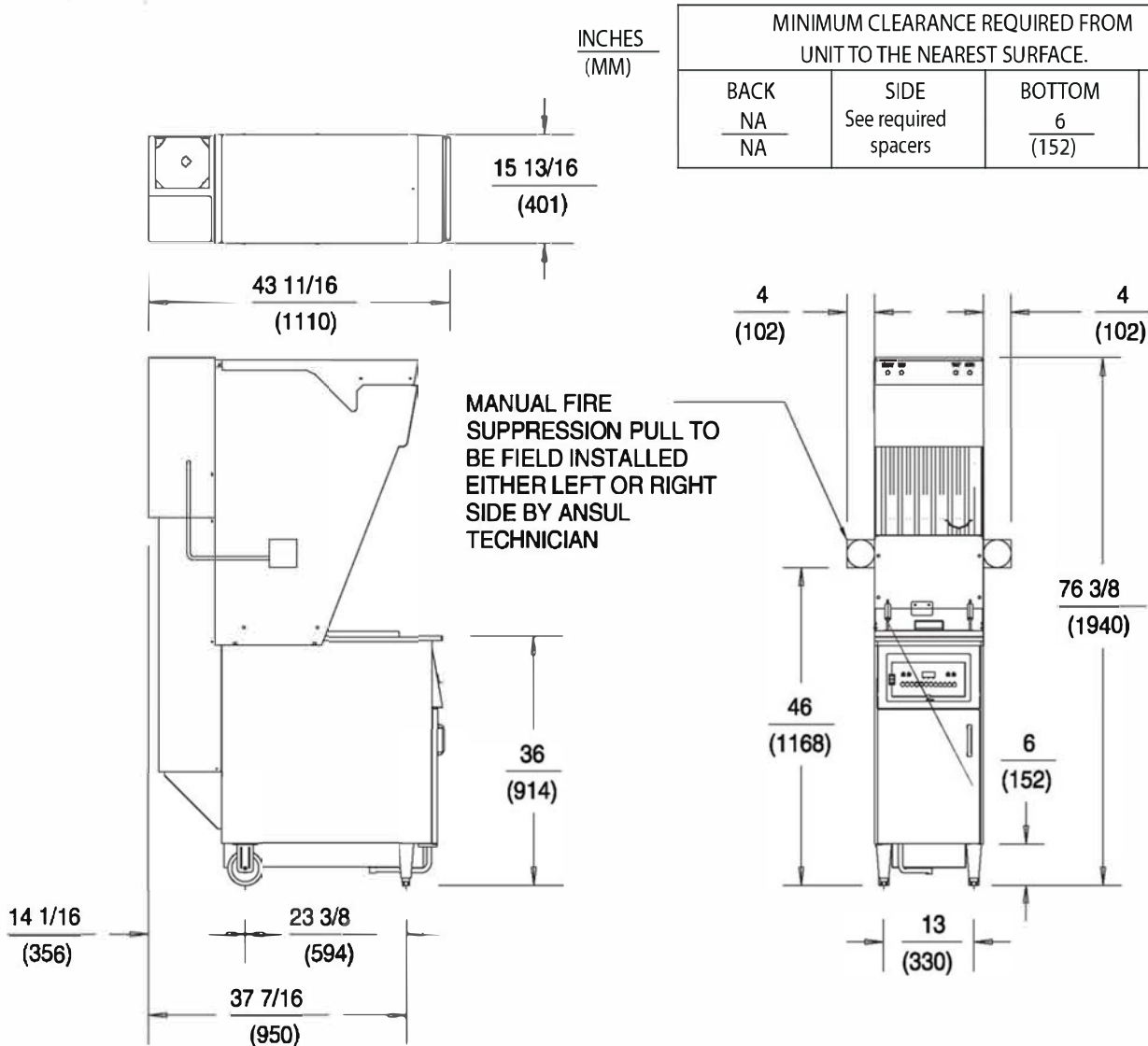
WVAE REV (B) 8/20





VCS 2000 - Ventless Cooking Systems Ventless Fryers with Auto-Lift & Cabinet Base

MODELS □ WVAE55F □ WVAE55FC



MINIMUM CLEARANCE REQUIRED FROM UNIT TO THE NEAREST SURFACE.			
BACK	SIDE	BOTTOM	TOP
NA	See required spacers	6	8
NA		(152)	(203)

Model Number	W x D x H	Voltage & Phase	Watts	Amps Single Phase	Amps Per Line 3Phase L1 L2 L3	NEMA	Weight (Shipping)
WVAE55F	15-13/16" x 43-11/16" x 76-1/2" 401mm x 1110mm x 1940mm	208V 3Ø	17,000	N/A	47.8 47.2 47.8	NONE	556
		240V 3Ø	17,000	N/A	41.5 41.0 41.5		
WVAE55FC	15-13/16" x 43-11/16" x 76-1/2" 401mm x 1110mm x 1940mm	208V 1Ø	11,340	56	N/A	NONE	556
		208V 3Ø	17,000	N/A	48 48 47	NONE	556
		240V 1Ø	11,340	48	N/A	NONE	556
		240V 3Ø	17,000	N/A	42 42 41	NONE	556

WVAE REV (B) 8/20

Due to periodic changes in designs, methods, procedures, policies and regulations, the specifications contained in this sheet are subject to change without notice. While Wells exercises good faith efforts to provide information that is accurate, we are not responsible for errors or omissions in information provided or conclusions reached as a result of using the specifications. By using the information provided, the user assumes all risks in connection with such use.



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Specifications are subject to change without notice and are not intended for installation purposes. See installation instructions prior to installing the unit.