SPECIFICATIONS

FOR

TENDER

BOOK 1 of 1

TOWNSHIP of GUELPH/ERAMOSA

8348 WELLINGTON RD 124

ROCKWOOD, ONTARIO

PROJECT NO. 2210

SET NUMBER

GRINHAM ARCHITECTS
15 YARMOUTH STREET
GUELPH, ON, N1H 4G2

ISSUED FOR TENDER

JUNE 2023

PROJECT TEAM DIRECTORY:

ARCHITECTURAL CONSULTANT

Grinham Architects
15 Yarmouth Street, Guelph, ON, N1H 4G2

Samuel Herschorn
T: 519.766.1580 x2333
F: 519.766.1377
E: sherschorn@grinham.ca

ELECTRICAL CONSULTANT

JTech Consulting
Electrical Engineering for Buildings and Infrastructure

Julian Klich, P.Eng.
T: (548) 483-6456
E: julian@jtechconsulting.ca
W: https://jtechconsulting.ca

SITE SERVICES CONSULTANT

THIS PAGE

INTENTIONALLY BLANK

APPENDICES

N / A

END OF SECTION

Part 1 General

1.1 TENDERS

.1 Tenders for the **Guelph/Eramosa Township New Signage Project**, in the Township of Guelph/Eramosa, Ontario in accordance with Drawings and Specifications included with these Tender Documents, will be received by:

Grinham Architect Inc.

Marked to the attention of

Samuel Herschorn

At the office of Grinham Architects Inc.:

15 Yarmouth Street
Guelph, Ontario
N1H 4G2

Tenders will be received on **Monday July 24, 2023** as follows:

- Tender Form – Part I – until **3:00 P.M.** (15:00 hrs) local time;
- Tender Form – Part II – until **3:00 P.M.** (15:00 hrs) local time;

Bids will be opened privately in the Boardroom of Grinham Architects Inc. following the Part II Tender Closing.

.2 Submit one (1) completed original of each of the Base Bid Form and any required supplementary bid forms, electronically to info@grinham.ca

.3 Bids must be received before and not later than 3:00:00 PM local time on Monday July 24th, 2023. The term "local time" shall mean the time as measured by the time stamp applied to the email submission. Bids will be dated and time stamped electronically by the system.

Tender for: **Guelph/Eramosa New Signage Project**
Project No. 2210

.4 Tenders received after the specified delivery times will be disqualified and returned unopened.

.5 Tenders shall be submitted on the Stipulated Price Bid Forms **(Tender Form – Part I and Part II)** as provided, fully completed without deletions, alterations, or erasures and signed by the appropriate Signing Authority of the Bidder's organization. Signature of the Signing Authority for the Bidder shall be accompanied by the Corporate Seal.

.6 Tenders shall be for a Stipulated Sum without escalation clauses or other qualifications. All taxes and duties in force during the Tender period and known to be applicable during the construction period shall be included in the Tender in accordance with the requirements of the Supplementary Conditions.

.7 Before submitting a Tender, Bidders shall visit and carefully examine the Site of the proposed Work, fully inform themselves of the existing conditions and limitations and shall include in their Tender price a sum to cover the cost of all items

contemplated in the Contract. No allowance will be made subsequently in this regard on behalf of the Contractor for any error or negligence on his part.

.8 No oral, telephonic, or telegraphic proposals will be considered.

1.2 MANDATORY SITE MEETING

.1 **A mandatory site meeting for all <u>general contractors</u>** has been scheduled on **Wednesday, July 5th, 2023 commencing at 10:00 AM** at the Place of Work (8348 Wellington Rd 124. Rockwood, Ontario). Please meet at the main lobby entrance. All Bidders must attend and will be required to sign the "Site Meeting Log" to confirm their attendance. Subcontractors are encouraged, but not required to attend this Site Meeting.

.2 Failure to attend shall result in disqualification of bidders for work of this Contract. Bids received from bidders who failed to attend the mandatory site meeting, as determined from the "Site Meeting Log" shall be returned unopened.

.3 Representatives of the Consultant and/or the Owner will be in attendance and will conduct the Bidders' briefing and tour. Questions and Answers addressed during the meeting will be subsequently documented in an Addendum to all Bidders.

.4 Bidders and their sub-trades are required to be familiar with all matters discussed at this briefing and tour, and submission of Bid shall be taken as warranty that the Bidder and his trades are familiar with all site conditions and all matters discussed at the site briefing and tour.

.5 Bidders shall carefully examine the Place of the Work and fully inform themselves of all existing conditions, limitations and difficulties that may arise during or which may adversely affect the execution of the Work. Bidders shall immediately notify the Owner of any conditions which may adversely affect the completion of the Contract.

.6 Bidders shall include in their Bid Price all costs to complete the Work. The Owner will not consider any claims, and no amounts will be paid, for additional payment or time during the execution of the Work for extra work costs, damages or difficulties encountered resulting from conditions which were either visible or could be reasonably inferred from an examination of the Bid Documents, The Place of the Work, or adjacent surrounding public or private properties prior to the Bid Closing time.

.7 Upon completion of the specified new Work, the Bidder shall reinstate the balance of the Place of the Work to its original condition; and shall reimburse the Owner for any cost of repair to damaged products and/or systems designated to be relocated or to remain within the Place of the Work.

1.3 QUESTIONS DURING TENDERING

.1 Bidders finding discrepancies or omissions in the Drawings or Specifications shall at once notify the Consultant who shall send written clarification, instructions or explanations to all Bidders. Bidders may, during the Tender period, be advised by Addenda of any additions, deletions, or alterations to the Specifications and

Drawings. All such changes shall be included in the Tender and shall become part of the Contract Documents.

Questions arising during the Tender period shall be directed to and subsequently confirmed in writing (*by email*) to:

Samuel Herschorn
L. Alan Grinham Architect Inc.
E-mail: ***sherschorn@grinham.ca***

.2 Questions will be received by email up until **5pm on Wednesday, July 19th, 2023**, in order to allow sufficient time to equitably notify all Bidders by Addendum of any directions of clarifications arising from such questions.

.3 Questions must be emailed. Questions by telephone or fax will not be received.

1.4 AWARD

.1 The right to reject any or all Bidders, to waive informalities, or to accept any Bidder as most satisfactory in the opinion of the Owner, is expressly reserved by the Owner without liability on the part of the Owner or Architect.

.2 The basis for acceptance of Tender will not necessarily be lowest bid. The evaluation of sub-trades listed, proposed construction time-frames, and the Contractor's demonstration of understanding of the nature and scope of the project may be considered by the Owner in award of Contract.

.3 Should the lowest Bid exceed the project budget, the Bid documents may be amended by Post-Tender Addenda and/or Supplementary Drawings. These will only be issued to a maximum of three Bidders submitting the lowest initial Tender Bids.

.4 Should the lowest Bid exceed the project budget, the owner may choose to only proceed with the number of signs as will meet their budget.

.5 It shall be understood by all Bidders that the Tender shall be valid and subject to acceptance by the Owner, and that no adjustment shall be made to the Tendered Amount, for a period up to and including **thirty (30)** days from the date of Closing of Tenders.

.6 The successful Bidder shall be required to execute the 2008 edition of the Standard Construction Document CCDC 2 – Stipulated Price Contract, as amended by the Supplementary General Conditions of the Contract.

1.5 MATERIAL & EQUIPMENT

.1 All Tenders must be based upon materials and equipment of manufacture, type and design as specified. Substitutions proposed by the Bidder will be considered only as **an addition (extra) to - or a deletion (credit) to** the Base Tender Price, and must clearly indicate the exact nature of variance from the Specification. Proposed substitutions may be appended under item **4.0 Substitutions of Section 00 07 20 Tender Form – Part II.**

.2 Unsolicited Alternatives or Substitutions may be proposed by the Bidder as follows:

.1 During the Tender period, if proposals are submitted in sufficient time to allow for analysis and issuance of Addendum to include the proposal, should the proposal be deemed acceptable;

.2 When an Addendum has not been issued, on the basis of a written proposal submitted as a separate document attached to the Tender Form, in which the proposed Alternative is completely specified, the reason for the substitution is given, the differences between the specified and proposed alternatives are defined, and the amount by which the Stipulated Price Bid will be increased or decreased.

.3 The Owner will not necessarily accept alternatives by the Bidder.

.4 The Contractor shall accept full responsibility that a proposed Alternative will not exceed dimensional requirements indicated on the Drawings, and that it is compatible in all ways with the other specified Work. The contractor shall coordinate and assume all costs associated with the installation of the Alternative, including the costs of all sub-trades affected, foreseen or unforeseen.

1.6 LIST OF SUB-CONTRACTORS

.1 Bidders shall submit on the Tender Form – Part II a complete list of Sub-Contractors to whom it is proposed to Sub-contract any portion of the Work. This list shall include the requested names of all Sub-Contractors who will be performing Work on the site, either on behalf of the General Contractor or any of his Sub-contractors.

.2 Sign Manufacturer is to be selected from the following prequalified list:

.1 Hansen Signs –Allan Hines
allan@hansensigns.com

2. Fine Lines Signs – Sean Mcgrattan
sean.mcgrattan@finelinessigns.com

3. Pride Signs – Brian Blackburn
bblackburn@pridesigns.com

4. Signs Galore – Stephen Fitz-Henry
stephen@signsgalore.ca

5. Custom Signs – Brian Machan
customsigns@wightman.ca

6. Spectra-Signs
e.kemaeva@spectra-signs.com

1.7 CASH ALLOWANCES

.1 In accordance with the provisions of the General Conditions, Cash Allowances are included in the Tender Price as follows:

Material Testing and Inspection **$2,000.00**

Base Bid Total to be included for stipulated Cash Allowances: **$ 2,000.00**

.2 The Cash Allowance amounts noted above **exclude** *Value Added Taxes of 13%* (H.S.T.). The Contractor **shall include** an amount for *Value Added Taxes* relevant to these Cash Allowances values when completing the Tender Form.

1.8 DOCUMENT ISSUE

.1 Documents upon which this Tender is based are as follows:

- Instructions to Bidders
- Stipulated Price Bid Form – **Part I & II**
- Specifications – Bidding Requirements and Divisions 1-16 incl.
- Drawings (see Section 00 01 15 – List of Drawing Sheets)

.2 Documents for Tender purposes will only be issued as complete Tender Sets, in their entirety.

.3 Bid Documents may be viewed at the Offices of the Owner.

.4 Upon receipt of Bid Documents, Bidders shall verify that the documents are complete. Bidders shall immediately notify the Consultant if the Bid Documents are incomplete or upon finding discrepancies, errors or omissions in the Bid Documents.

END OF SECTION

1 Tender Price .1 Having carefully examined the Instructions to Tenderers, General Conditions, Supplementary Conditions, Drawings, Specifications, and Addenda for the **Guelph/Eramosa Township Signage Project,** as prepared by Grinham Architects Inc., as well as the premises and conditions affecting the Work, We

_____ ,
Contractor
of

_____ ,
Registered Business Address, Postal Code

offer to furnish all labour and materials required to complete the work of all trades in accordance with the said documents for the Stipulated Sum (*Contract Price*) of:

Sign #1

_____ / Dollars

($_____.____) in lawful money of Canada.

Sign #2

_____ / Dollars

($_____.____) in lawful money of Canada.

Sign #3

_____ / Dollars

($_____.____) in lawful money of Canada.

Sign #4

_____ / Dollars

($_____.____) in lawful money of Canada.

Sign #5

_____ / Dollars

($_____.____) in lawful money of Canada.

.2 We have ***excluded*** from the Stipulated Sum *Value Added Taxes of* ***13%*** (HST) of :

_____ / Dollars

($_____.____) in lawful money of Canada.

.3 The Total amount payable by the *Owner* to the *Contractor* for the construction of the *Work* (Stipulated Sum+*Value Added Taxes*) is:

_____

_____ / Dollars

($_____.____) in lawful money of Canada.

2 Schedule

The undersigned agrees and guarantees to commence the Work **within _____ weeks of Contract Award.**

The undersigned agrees and guarantees to Substantially Perform the Work **within _____ weeks of commencement of the Work of the Contract.**

3 Documents

The Documents upon which this Tender is based are as follows:

- Instructions to Tenderers
- Tender Forms, **Part I and Part II**
- Drawings: (See Drawing Index, Section 00 01 15)
- Specifications: Bidding Requirements and Specification Divisions 1 - 16 incl.;
- Addendum No. ____ dated _____
  through
  Addendum No. ____ dated _____

4 Cash Allowances

In accordance with the Instructions to Bidders, Cash Allowances are included in the Tender Price as follows:

- **Material Testing and Inspection $2,000.00**

Base Bid Total to be included for stipulated Cash Allowances: $ 2,000.00

5 Execute Contract

We the undersigned agree that if notified of the acceptance of this Tender Bid within ten (10) days of the date and time set for the closing of Tenders, we will:

Execute a Contract with the Owner for same in the form of a Standard Construction Document CCDC - 2 (2008) for Stipulated Price Contract.

SIGNATURE OF TENDERER

_____
Contractor

_____ _____
Signature *Title*

Dated At _____
Municipality

This _____ day of _____ **2023.**

END OF TENDER FORM - PART I

1.0 List of Sub-contractors

	Sub-contractor or Supplier / Location	***Sub-Contract $ Value***
Demolition	_____ / _____	$ _____
Concrete	_____ / _____	$ _____
Rebar	_____ / _____	$ _____
Sealants	_____ / _____	$ _____
Stone Veneer	_____ / _____	$ _____
Aluminum Sign Box	_____ / _____	$ _____
Grading/Trenching	_____ / _____	$ _____
Electrical	_____ / _____	$ _____

2.0 Unit Prices

.1 Electrician's labour rate per hour Regular: $_____; After hours: $_____

3.0 Separate Prices

.1 The following are our Separate Prices for the work listed hereunder. Such work and amounts are NOT included in our Base Price. These Separate Prices include overhead and profit, bonding, insurance, permit and inspection fees, and all other charges, but do NOT include HST.

.1 N/A $_____

4.0 Alternate Prices

.1 The following are our Alternate Prices to add / delete the work listed hereunder. These Alternate Prices include overhead and profit, bonding, insurance, permit and inspection fees, and all other charges, but do NOT include HST.

.1 N/A

5.0 Substitutions

.1 For consideration by the Owner and Consultants we enclose a typed list of un-solicited / proposed Substitutions and corresponding Changes to our Base Bid Tender Amount which would result from acceptance by the Owner and Consultants of these substitutions. The difference in Tender Amount includes all changes to the Work of any other trades affected by these proposed substitutions.

Item	***$ Amount ADDED***	***$ Amount DEDUCTED***
(Please Specify)		
.1 _____	$_____	$_____
.2 _____	$_____	$_____
.3 _____	$_____	$_____

(attach additional pages on Company Letterhead if necessary)

SIGNATURE OF TENDERER

_____
General Contractor

_____ _____
Signature *Title*

Dated At _____
Municipality

This _____ day of _____2021.

END OF TENDER FORM - PART II

ARCHITECTURAL

A0 COVER SHEET
A-1 SIGN FRONT & REAR ELEVATION
A-2 SIGN SIDE ELEVATIONS
A-3 SIGN SECTION DETAILS
A-4 SIGN PLAN DETAILS
A-5 SITE #1 - 8348 WELLINGTON RD 124
A-6 SITE #2 - 5141 WELLINGTON RD 27
A-7 SITE #3 - 330 ALMA ST, ROCKWOOD
A-8 SITE #4 - 127 DUNBAR ST, ROCKWOOD
A-9 SITE #5 - 7384 WELLINGTON RD 30

ELECTRICAL

E-101 ELECTRICAL PLANS - 8348 WELLINGTON RD 124
E-102 ELECTRICAL PLANS - 5141 WELLINGTON RD 27
E-103 ELECTRICAL PLANS - 330 ALMA ST, ROCKWOOD
E-104 ELECTRICAL PLANS - 127 DUNBAR ST, ROCKWOOD
E-105 ELECTRICAL PLANS - 7384 WELLINGTON RD 30

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Work under this Contract includes all work necessary to complete the Project in accordance with the drawings and specifications. Without limiting the generality of the foregoing, the project consists of: Supply and Installation of 5 new Township signs at 5 different locations.

.2 The General Contractor / Contractor shall be the Constructor as defined in the applicable Occupational Health & Safety Legislation.

1.2 DOCUMENTS REQUIRED

.1 Make available at the site, one copy of each of the following:

- .1 Contract drawings
- .2 Specifications
- .3 Addenda
- .4 Reviewed shop drawings
- .5 Change Orders and Site Instructions
- .6 Other modifications to Contract
- .7 Field test reports
- .8 Copy of approved Project Schedule
- .9 Record Drawings

1.3 WORK SCHEDULE AND PROGRAMME

.1 Refer to Specification Section 01 32 13 – Scheduling of Work.

.2 The Completion Date as detailed in Section 01 32 13 of these Specifications is determined to satisfy Owner requirements and the Contractor is to include **ALL CHARGES** for premium time work or any other considerations as required to meet the specified date.

.3 If the Contractor considers for any reason that they will be unable to complete the work by this date, a request for amendment is to be made with a new date given and justification for the request within 21 days of the Award of Contract.

.4 The Contractor and Sub-Contractors shall ensure that upon award of a Contract any materials or equipment not previously ordered by Owner will be ordered to ensure compliance with this Programme. They shall immediately inform the Owner and Consultant of any difficulty in this respect.

.5 The Contractor and Sub-Contractors shall ensure that adjacent neighbors to Work areas are always to be respected in terms of construction noise and obstructions.

.6 The Contractor and Sub-Contractors shall be aware that all buildings on the Site will be inhabited for the duration of Construction and access to the existing parking lot must remain available to occupants at all times.

1.4 CODES AND STANDARDS

.1 The Contractor shall perform and complete all work covered by the Contract Documents.

.2 The Contractor will be required to perform all work in accordance with official Guelph/Eramosa Township Building Department Drawings and Specifications bearing the Municipal "Reviewed" stamp.

.3 The Contractor shall notify the Consultant promptly when a Building Official provides any instructions pertaining to the Work. The Contractor must record all such verbal instructions from Building Officials.

.4 All Work shall be performed in accordance with the following Codes and Standards, as applicable:

.1 General Construction – the latest edition of the Ontario Building Code;

.2 Plumbing – Code and Guide for Plumbing 1997 containing the Building Code Act and O. Reg. 403/97;

.3 Electrical – the latest edition of the Ontario H.E.P.C. Code;

.4 Any other applicable Provincial, Municipal and Fire Marshal Regulations.

1.5 PERMITS AND FEES

.1 Building Permit Application and Fees are to be made and paid in their entirety by the Owner, to the Guelph/Eramosa Township.

.2 All other inspection fees, etc, remain the responsibility of the Contractor.

1.6 CONTRACT COST BREAKDOWN

.1 Before submitting the first Application for Payment, submit breakdown of Contract Price in detail as directed by the Consultant. The cost breakdown will be used as the basis for progress Payment Applications after review and acceptance by the Consultant.

1.7 CONTRACTOR'S USE OF SITE

.1 Provide and erect fencing, hoarding and/or barriers to provide proper site protection in accordance with all current and applicable construction safety regulations and workplace requirements, so as to hold the Owner harmless from any damage or expense arising from the Contractor's failure to properly and/or safely execute such work.

1.8 CLEANING

.1 The Contractor is solely responsible for the clean-up of the work site at the end of each day, final clean-up upon completion of this Contract, and repair of any damage caused during Construction.

.2 Ensure that the site and exterior areas as accessed for the construction are kept clean and tidy at all times throughout the construction period, removing all rubbish and debris promptly as it accumulates. Ensure that all sub-trades conform similarly. Rubbish and surplus materials shall be removed promptly from the site and disposed of by the Contractor.

.3 Further to instructions contained in various divisions of the Specifications relating to cleaning and polishing of finished work, the General Contractor shall be immediately responsible for:

.1 Cleaning and polishing of all fixtures, finishing hardware, metal surfaces, fittings and equipment;

.2 Removal of all surplus paint, putty and other materials on all exterior surfaces throughout the site;

.3 Cleaning all surfaces affected by construction activities.

.4 All cleaning and polishing of work as outline above shall be done immediately prior to handing over the building to the Owner, and such work shall be done to the approval of the Consultant and Owner's representative.

1.9 ADVERTISING

.1 Advertising of any kind shall not be permitted on site without the Owner's prior written approval.

1.10 SETTING OUT OF WORK

.1 Contractor to assume full responsibility for, and execute complete layout of work to locations, lines and elevations indicated by the Contract Documents.

.2 Provide all devices needed to layout and construct the Work.

.3 Supply such devices as straight edges and templates required to facilitate Owner and/or Consultant's review of the Work.

1.11 LOCATION OF EQUIPMENT AND FIXTURES

.1 The location of apparatus, fixtures, outlets, and other like items shown or specified unless specifically dimensioned shall be considered as approximate only. The actual location shall be as confirmed and directed by the Consultant to suit the conditions at the time of installation.

.2 Before installation, the Contractor shall review with the Consultant and confirm the precise location. Failure to confirm the layout locations with the Consultant shall entitle the Consultant to order at the Contractor's expense, such changes in layout and installation as may be reasonably required.

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

1.12 CONCEALMENT

.1 Conceal pipes, ducts and wiring in signage construction of finished areas except where indicated otherwise.

1.13 CUTTING, FITTING AND PATCHING

.1 Execute cutting (including excavation), fitting and patching required to make Work fit properly together.

.2 Obtain Engineer's approval before drilling, cutting, boring, or sleeving any load-bearing members.

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

.4 Fit and seal Work airtight to pipes, sleeves, ducts and conduits.

1.14 ADDITIONAL DRAWINGS

.1 Consultant may furnish additional drawings to assist proper execution of work. These drawings will be issued for clarification only. Such drawings shall have the same meaning and intent as if they were included with drawings of the original Contract Documents.

1.15 WORKMANSHIP

.1 Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties for which they are employed.

.2 Findings as to the quality or fitness of workmanship in cases of dispute rest solely with the Consultant(s), whose decision is final.

1.16 CO-ORDINATION

.1 The Contractor is responsible for coordinating his/her work to ensure:

.1 Progress is maintained to meet the Completion Date;

.2 Proper arrangement for delivery of all materials and products.

.2 Ensure co-operation of workers in laying out work. Maintain efficient and **CONTINUOUS** Site Supervision.

.3 The Contractor shall be responsible for co-ordination and placement of all openings, sleeves and accessories.

1.17 FASTENINGS

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

.2 Use non-corrosive hot-dip galvanized steel fasteners and anchors for securing all exterior work, unless stainless steel or other material is specified.

.3 Minimize exposed fastenings; space evenly and install neatly.

.4 Fasteners which cause damage to material to which anchorage is made are not acceptable.

1.18 PROTECTION OF WORK IN PROGRESS

.1 Adequately protect work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired as directed by the Consultant, at no increase to the Contract Price.

.2 Prevent overloading of any part of the building. Do not cut, drill, or sleeve **ANY** load bearing structural member without prior written approval of Engineer.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 01 56 00 – Temporary Barriers and Enclosures.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work under this Contract includes all work necessary to complete the Project in accordance with the drawings and specifications. Without limiting the generality of the foregoing, the project consists of the Supply and Installation of 5 new township signs. Signs will require concrete foundations & stone veneer base, and 2 LED programmable displays (on either side) in an aluminum sign cabinet provided by a suitable sign manufacturer.

1.3 CONTRACT METHOD

.1 Construct Work under CCDC 2 - 2020 Stipulated Price Contract Between Owner And General Contractor – For Services And Construction contract.

.2 Relations and responsibilities between Contractor and subcontractors and suppliers are as defined in Conditions of Contract. Assigned Subcontractors must, in addition:

.1 Furnish to Contractor, bonds covering faithful performance of sub-contracted work and payment of obligations there-under when Contractor is required to furnish such bonds to Owner and Consultant.

.2 Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contractor is required to provide to the Owner and Consultant.

1.4 WORK SEQUENCE

.1 Co-ordinate Progress Schedule and co-ordinate with Owner' Representative at all time regarding access throughout the various sites.

.2 Maintain fire access/control and all Fire Detection and alarm systems at all times.

1.5 CONTRACTOR USE OF PREMISES

.1 Specific / limited use of designated Construction Site area as defined by Owner until Substantial Performance.

.2 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

Part 2 Products

2.1 SIGN CABINET SUPPLY & INSTALLATION

.1 Aluminum sign cabinet, LED programmable displays, built-in electrical & steel framing to be supplied and installed by a suitable manufacturer. General Contractor to include sign manufacturer as a sub contractor as part of their quote for services. GC to coordinate the manufacturer's services & installation with the overall project scope and schedule.

.2 Sign manufacturer to submit shop drawings for review & approval prior to fabrication.

.3 Sign manufacturer will supply and install each sign, complete with internal steel and aluminum structure, with LED message boards.

.4 Sign manufacturer will provide General Contractor with anchor pins and an installation pattern at the beginning of the project. GC to coordinate with manufacturer for installation of the anchor pins and main electrical conduit.

.5 GC to coordinate with electrician and sign manufacturer for final hookup and connection.

SIGNAGE
LED DISPLAY

.1 **Daktronics** 10mm Outdoor Electronic Message series GT6x Series. D/F - (2) single-sided cabinets. Cabinet size - 4'2"h x 7'6"w x 7"d; active viewing area - 3'8"h x 7'3"w. Daktronics 4G cellular communication kit. GalaxyPro external temperature sensor. Venus Control suite basic 10-year subscription.

2.2 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 CASH ALLOWANCES

.1 Expend each Allowance as directed. Allowances will be adjusted to actual cost as defined hereunder. Allowances may be used only for the work specifically designated either therein or by Specification Section Number. Where materials and products are Specified they are to be provided under the base Contract and not under Cash Allowance. Progress Payments will be made for Allowance Work as authorized when claimed with appropriate documentation.

.2 Include the following Cash Allowance total as indicated:

Pre-Order (by Owner) Payment for <u>Supply and Delivery</u> to Site of specified Sign Cabinet & LED Panels	**$ _____**
Material Testing and Inspection:	**$ 2,000.00**
Other (T B A)	
Base Bid Total to be included for stipulated Cash Allowances.	***$ _____***

.3 **Note:** The Cash Allowance amounts noted above **exclude** *Value Added Taxes of 5%* (G.S.T.).; **Include applicable PST**.

.4 Material Allowances:

.1 Amount of each material allowance includes:

.1 Net cost of material;

.2 Applicable taxes and duties;

.3 Delivery to the site;

.4 Installation - IF INDICATED above;

.5 In addition to stipulated Cash Allowance amounts (above) include in Base Bid Tender Price sufficient costs for all other incidental costs:

.1 Protection from elements, from damage.

.2 Overhead and profit.

.3 Other expenses required to complete installation of Cash Allowance items such as supervision or co-ordination of other trades, other G. C. Administrative or incidental costs.

.5 **Material Testing and Inspection:** to be expended as directed by Consultant using approved Testing and Inspection Agency as approved by Owner and Consultant.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Requirements for co-ordination and scheduling of project meetings

1.2 PRECONSTRUCTION MEETING

.1 After Award of Contract, the Consultant will co-ordinate a meeting of all participants in the Work.

.2 Owner's representative / Project Manager, Consultants (Architect, Engineers), General Contractor, key Sub-Contractors (including but not limited to Mechanical, Electrical Sub-Contractor) and Site Superintendent will attend.

.3 Agenda to include the following:

.1 Designation of representatives of participants in the Work.
.2 Schedule of Work.
.3 Co-ordination with and Notification of Tenants for Site Work
.4 Schedule of submission of Shop Drawings, samples, colour chips.
.5 Requirements for temporary facilities.

1.3 PROGRESS MEETINGS

.1 During course of work, schedule Progress Meetings every two weeks or as agreed by Owner / General Contractor and Consultant.

.2 Contractor, major Sub-contractors involved in work, Consultant(s) and Owner's representative(s) to attend.

.3 Contractor to record minutes of meetings and circulate to attending and affected parties within **five (5) working days**.

.4 Agenda to include the following:

.1 Review and approval of minutes.
.2 Review of work progress and schedule.
.3 Field observations, problems, conflicts and corrective measures.
.4 Review submittal and delivery schedules.
.5 Pending changes and substitutions.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Requirements for scheduling and completion of the Work.

1.2 SCHEDULE

.1 Contract is to be scheduled towards being Substantially Performed prior to, and new equipment ready for use by the Owner / Residents not later than **July 31, 2023** in accordance with the General and Supplementary Conditions of the Contract.

.2 Scheduling and Tender shall include for all temporary enclosure, work and heating necessary to enable construction of the Work during inclement weather periods.

.3 Estimated date to commence Work (Mobilization) is on or about **June 1, 2023.**

.4 Provide within 5 days of Award of Contract, a detailed Project Schedule demonstrating compliance with the required Work progress stages and final completion of Work to maintain the above noted Schedule. Provide with the Work Schedule a correlated schedule of Progress Payments.

.5 Assist and co-operate with the Owner / Project Manager and Consultant in maintaining the detailed Project Schedule.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Health and safety requirements to ensure that site personnel observe and enforce construction safety measures required by Ontario Building Code (2012), The Occupational Health and Safety Act, latest edition, Worker's Compensation Act, Workplace Safety & Insurance Board and all Municipal statutes and authorities.

1.2 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

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

.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario

.1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990 as amended July 2019.

.2 Ministry of Transportation Ontario Traffic Manual - Book 7 - Temporary Conditions as amended April 2022.

1.3 SUBMITTALS

.1 Submit site-specific Health and Safety Plan: Within **7 days** after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site-specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.2 Submit **two (1) copy** of Contractor's authorized representative's work site health and safety inspection reports to Owner and Consultant *if requested*.

.3 Submit **two (1) copy** of reports or directions issued by Federal, and Provincial health and safety inspectors, to Owner and Consultant.

.4 Submit **two (1) copy** of incident and accident reports to Owner and Consultant.

1.4 FILING OF NOTICE

.1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.5 GENERAL REQUIREMENTS

.1 Observe and enforce construction safety measures required by the latest edition of the Ontario Building Code, The Occupational Health and Safety Act, latest edition, Worker's Compensation Act, Workplace Safety & Insurance Board and all Municipal statutes and authorities.

.2 In event of conflict between any provisions of above authorities the most stringent provisions will apply.

.3 Provide first aid facilities at the job site, maintained and readily accessible.

1.6 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Health and Safety Act and Regulations for Construction Projects, R.S.O 1990, as amended July 2019.

1.7 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factors, hazards, or conditions occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of authority having jurisdiction and advise Owner and Consultant verbally and in writing.

1.8 POSTING OF DOCUMENTS

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

1.9 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Consultant.

.2 Provide Consultant with written report of action taken to correct non-compliance of health and safety issues identified.

1.10 GENERAL SAFETY REQUIREMENTS

~~.1 Explosive Actuated Tools:~~

~~.1 These tools may only be used in accordance with the standards specified under the latest edition of the C.S.A. Z185 Code for explosive actuated tools.~~

~~.2 Blasting or other use of explosives is not permitted.~~

.2 Elevated Platform Equipment: All operators and persons using elevated platforms must be tied off to the platform at all times, even when the equipment is stationary. Operators and users of the equipment must be equipped with a safety body harness and lanyard.

.3 Hoisting Apparatus: All hoisting equipment must be maintained and operated in accordance with the applicable legislation.

.4 Flammable Liquids: Flammable liquids used on the job site are to be kept to a minimum and must be stored in approved safety containers. The use or storage of flammable liquids must be approved by the Consultant.

1.11 EMERGENCIES - FIRE OR ACCIDENTS

.1 Fire: The Consultant and Owner must be contacted in the event of an outbreak of fire on site. The Contractor shall provide fire extinguishers in areas where open flame work is being conducted.

.2 Accidents: In addition to the requirements of applicable legislation, in any emergency requiring the use of a resuscitator, the Consultant and Owner shall be notified.

1.12 EMERGENCY TELEPHONE NUMBERS

.1 Ambulance Service: 9 – 1 – 1

.2 Local Hospital: Guelph General Hospital
115 Delhi St, Guelph, ON N1E 4J4
+1 519 822 5350

Products

1.13 NOT USED

.1 Not used.

Part 2 Execution

2.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Inspection and testing, administrative and enforcement requirements.

.2 Equipment and system adjust and balance.

1.2 RELATED SECTIONS

.1 Section 01 21 13 – Cash Allowances.

.2 Section 01 33 00 – Submittals Procedures.

.3 Section 01 78 00 – Closeout Submittals.

1.3 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2 - 2020, Stipulated Price Contract - for Services and Construction.

1.4 INSPECTION

.1 Refer to CCDC 2, General Conditions GC 2.3.

.2 Refer to SUPPLEMENTARY CONDITIONS Specification Section 00 73 00 of this Specification for modification to these General Conditions of the Contract.

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

.4 Consultant may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.5 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Consultant for purpose of inspecting and/or testing portions of Work.

.2 Allocated costs: to Section 01 21 13 – CASH ALLOWANCES.

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

.4 Employment of inspection/testing agencies does not relieve Contractor of responsibility to perform Work in accordance with Contract Documents.

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

1.6 PROCEDURES

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

.2 Submit samples and/or materials required for testing, as Specified. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

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

1.7 REJECTED WORK

.1 Refer to CCDC 2, General Conditions GC 2.4

.2 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.

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

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

1.8 REPORTS

.1 Submit **one (1) digital copy** of inspection and test reports to Consultant; plus **one (1) digital copy** to the Owner.

.2 Provide copies to Sub-contractor of work being inspected or tested, and manufacturer or fabricator of material being inspected or tested.

1.9 TESTS AND MIX DESIGNS

.1 Testing and technical inspection will be required for, but not limited to:

.1 Concrete sign base & foundations;

.2 Electrical Systems.

.2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Consultant and may be authorized as recoverable.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART ONE - GENERAL

1.1 Related Sections

.1 Section 01 11 01 General Requirements

.2 Section 01 33 01 Submittals

.3 Section 01 45 01 Quality Control

.4 Section 01 61 01 Material and Equipment

.5 Section 01 77 01 Contract Close-Out

.6 Division 16 – Electrical

.7 Division 17 – Communications

1.2 Definitions

.1 Consultant Team – consists of those professionals who are responsible for the design and performance objectives and are listed in Section 00 00 03.

.2 Commissioning Team - consists of various participants involved in the commissioning process. The commissioning documentation and tasks of each team member will be coordinated through the Guelph/Eramosa Township

1.3 Commissioning Team

.1 Members of the team shall include the following as a minimum:

- Owner:
- Owner's Representative
- Owner's Facility Management Representative

Consultant Team
- Architect
- Electrical Consultant

Contractors
- General Contractor (GC/CM):
- Electrical Sub-contractor:
- Controls Sub-Contractor:
- Other Sub-Contractors (as applicable)

Other key players in the commissioning process include:
- Manufacturer's Representatives (as applicable)

1.4 Description

.1 Commissioning is a systematic process of ensuring that all building systems installed in accordance with the drawings and specifications, manufacturer's requirements and good industry practice. Commissioning also ensures that equipment operates and performs, in and of itself as well as in the system, as was intended by the designers in response to the owner's requirements. Finally commissioning **also** ensures the owner has the documentation and training required to operate the equipment and systems in a safe, efficient and long lasting manner.

.2 Commissioning does not take away from, reduce responsibility of or in any way diminish the requirement for the consultant team and installing contractors to provide a complete, finished and fully functioning product.

1.5 Owner Responsibilities

.1 Responsibilities of the owner are as follows:

.1 To provide operating personnel to attend training and instruction regarding specific components, equipment and systems.

.2 To observe on-site installation, start-up and testing equipment and systems.

1.6 Consultant Team Responsibilities

.1 Responsibilities of Consultant are as follows:

.1 Define the Basis of Design to meet the Owner's Project Requirements.

.2 Review contractor's shop drawings submission to ensure that the equipment proposed comply with specifications requirements.

.3 Review contractor's submittals to ensure compliance with the specifications requirements.

.4 Monitor, check, inspect and report on the installation throughout the construction stages to ensure the equipment installation is as approved and the installation method, workmanship, procedures will follow the approved submission and method statement.

.5 Inspect the systems installation and issue deficiencies reports. Ensure deficiencies are corrected and certify installation of systems.

.6 Review operating and maintenance manuals, balancing and test reports and as-built for accuracy.

1.7 Contractor Responsibilities

.1 General Contractor:

.1 Provide a designated representative to attend commissioning meetings.

.2 Coordinate the resolution of deficiencies identified through the commissioning process with the sub-trades.

.4 Coordinate scheduling of owner training with the sub-trades.

.5 Return to site approximately 10 months after the start of the warrantee period to review system operation and to address operational issues.

.5 Electrical Contractor

.1 Attend commissioning meetings scheduled by the Township.

.2 Provide a complete set of all submittals for electrical equipment to the Township

.3 Correct all deficiencies found and ensure all equipment and systems are fully functional and in complete and proper working order.

.4 Prepare O&M manuals and supplementary information on all equipment and assemble in binders tabbed and indexed. Supplementary information may include, but is not limited to, such items as power/control field wiring diagrams, equipment maintenance schedule, vendor and maintenance contact lists. Submit to Township when requested.

.5 Provide electrical system technicians to assist during system verification and functional performance testing.

.6 Provide a complete set of as-built record drawings and schematics.

.10 Return to site with the GC and Township approximately 10 months after the start of the warrantee period to review system operation and to address operational issues.

1.8 Equipment/Systems to be Commissioned

.1 The following systems will be commissioned:
- .1 Architectural Systems
  1. Information Specialties – including visual display surfaces (boards, screens)
     a. Operators and Operation

PART 3 - EXECUTION

3.1 Meetings

.1 Commissioning Meetings: commissioning meetings will be conducted as required throughout construction. These meetings will cover coordination, deficiency resolution and planning issues with particular Contractors and Subs.

3.2 Submittals

.1 Electrical Contractors shall supply one (1) copy of all shop drawings to designers for review, including all controls and shop drawings and narrative description of each control sequence for each piece of equipment or system controlled.

.3 Final completion of the O&M manuals including all required submittals is the responsibility of the Contractor.

3.3 Start-Up and Pre-functional Checks

.1 The installing contractor or sub-contractor shall be responsible for performing and documenting start-up based on manufacturer's requirements and/or good industry practice. They shall perform all required procedures and checks and document the results.

.2 Execution of Start-up and Pre-functional checklists

.1 Where appropriate manufacturers checklists and procedures shall be

provided by Electrical contractor/Manufacturer.

.2 The contractor, sub-contractor, manufacturer's rep or supplier shall perform pre-functional and start-up checks. They shall complete the checklist on each piece of equipment. Checklists shall be successfully completed prior to any functional performance testing (FPT).

.3 Only individuals with direct knowledge of and who personally witnessed any pre-functional or start-up activity shall sign off the checklists.

.4 It will be the responsibility of the contractor to remedy all deficiencies found. Retesting by the contractor may be required to demonstrate corrections have been made.

3.4 Functional Performance Testing (FPT)

.1 In general, functional performance testing is conducted after pre-functional and start-up checks have been satisfactorily completed, the control system is fully operational.

.2 The installing contractor or sub-contractor, shall execute all FPT and shall maintain responsibility for all equipment tested.

.3 Corrections of minor deficiencies identified during FPT may be made by the Contractor or Sub during the tests.

3.5 Training of Owner Personnel

.1 The contractor supplying each piece of equipment shall be responsible for providing complete and satisfactory training on that piece of equipment. Training may be performed by the contractor, supplier, manufacturer or others as the contractor may decide best able to provide that training.

.2 Owner personnel shall be provided with completed O&M Manuals at least 1 week prior to training. In addition, one hardcopy and one electronic copy (searchable PDF file format) of the related maintenance booklet and wiring as-builts shall be provided to owner personnel for the purpose of training.

.4 Basic training for each piece of equipment shall include the following items **where applicable:** at a minimum:

.1 General description of the system and its operation (Design Intent)
.2 Detailed itemization and identification of major components and access to same
.3 Detailed itemization and identification of operating controls and safeties including normal and abnormal sensor readings
.4 Review of the O&M manuals for identification of service requirements, procedures, wiring diagrams, parts identification, safety procedures, etc.
.5 Review of system drawings and schematics
.6 Review of control drawings and schematics
.7 Operational review for
  .1 Start-up
  .2 Normal operation
  .3 Shut down
  .4 Unoccupied operation

.5 Seasonal changeover
.6 Manual operation
.7 Controls set-up and programming
.8 Troubleshooting and alarms

3.7 Deferred Testing

.1 If any check or test cannot be completed due to weather conditions, the building structure, required occupancy condition or other deficiency, execution of pre-functional checks and/or FPT may be delayed upon approval of the owner.

**********END**********

Part 1 General

1.1 SECTION INCLUDES

.1 Labour, material and equipment for the installation of poured concrete foundations, retaining wall, and up-stands for patio pillars.

.2 For GM Frost, see Section 03 11 00 Concrete Forming: GM Frost.

1.2 RELATED SECTIONS

.1 Section 03 20 00 – Concrete Reinforcement: General.

.2 Section 03 30 00 – Cast-in-Place Concrete: General.

.3 Section 04 05 19 – Masonry Anchorage and Reinforcing: Supply of masonry accessories for placement by this section.

.4 Section 05 50 00 – Metal Fabrications: Supply of metal fabrications for placement by this section.

1.3 REFERENCES

.1 Canadian Standards Association (CSA)

- .1 ACI 301-05 – Specification for Structural Concrete for Buildings.
- .2 ASME A17.1-2007/CSA-B44-07 – Safety Code for Elevators and Escalators (Canada/USA harmonized standard).
- .3 CAN/CSA-A23.1 – 09 / A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .4 CSA-O86S1-05, Supplement No. 1 to CAN/CSA-O86-01 – 01 Engineering Design in Wood (Limit States Design)
- .5 CSA O121 - 08 Douglas Fir Plywood
- .6 CAN/CSA-O141 – 05 Softwood Lumber
- .7 CSA O151 - 09 Canadian Softwood Plywood
- .8 CSA-O153-M1980 (R2008) – Poplar Plywood.
- .9 CSA-O437 Series-93 (R2006) – OSB and Waferboard.
- .10 CSA S269.1 – 1975 (R2003) Falsework for Construction Purposes
- .11 CAN/CSA-S269.3 - M92 (R2003) Concrete Formwork.
- .12 COFI (Council of Forest Industries of British Columbia) – Exterior Plywood for Concrete Formwork.

1.4 DESIGN REQUIREMENTS

.1 Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.

.2 Conform to CSA-S269.3.

1.5 QUALITY ASSURANCE

.1 Perform Work in accordance with CAN/CSA-S269.3.

.2 Design formwork under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

1.6 REGULATORY REQUIREMENTS

.1 Conform to applicable code for design, fabrication, erection and removal of formwork.

1.7 INSPECTION AND TESTING

.1 Materials and workmanship will be subject to the inspection at any time. Co-operate in permitting access for inspection at all places where work is being done.

.2 Do not enclose formwork until reinforcing steel has been reviewed.

1.8 DELIVERY STORAGE AND HANDLING

.1 Separate waste materials for reuse and recycling.

.2 Place materials defined as hazardous or toxic in designate containers.

.3 Store off ground in ventilated and protected manner to prevent deterioration from moisture.

.4 Materials shall be handled and stored on the job site in such a manner as to cause no damage to other materials, to any existing building or property or to the new structure.

.5 Materials shall not be stored so as to hinder the work of the other trades.

Part 2 Products

2.1 WOOD FORM MATERIALS

.1 Plywood: plywood shall be new, sound and undamaged with clean true edges conforming to CAN/CSA-A23.1, CAN/CSA-O86.1, CSA O121, CSA O151.: Ainsworth 107.

.2 Lumber: lumber for forms, falsework, shoring and bracing shall be of new materials conforming to CAN/CSA-A23.1, CAN/CSA-O86.1, CAN/CSA-O141 and the applicable grading authority. All lumber shall be of a grade to which unit stresses can be assigned in accordance with CAN/CSA-O86.1 and all lumber shall bear the grade stamp of the marked by the authorized grading authority.

2.2 FORMWORK ACCESSORIES

.1 Form Release Agent: non-toxic, biodegradable and/or low VOC.

.2 Form stripping agent: non-staining, colourless, mineral oil, free of kerosene and compatible with the permanent finish coating of the concrete surface.

.3 Form ties: removable or snap-off ties, fixed and adjustable length, free of devices that will leave holes larger than 25mm (1") diameter in concrete surface and conforming to CAN/CSA-S269.3. Twisted wire ties will not be permitted.

.4 Corners: Use 25mm (1") chamfer strips on external corners and 25mm (1") fillets at interior corners and joints, unless specified otherwise.

.5 Waterstops, where indicated on drawings:

.1 Minimum 102mm (4") Polyvinyl chloride, by W.R. Meadows, or approved substitution.

Part 3 Execution

3.1 EXAMINATION

.1 Verify existing conditions before starting work.

.2 Verify lines, levels and column centres before proceeding with formwork and ensure that dimensions agree with Drawings.

3.2 EARTH FORMS

.1 Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

.2 Obtain Engineers approval for use of earth forms not indicated on drawings.

3.3 ERECTION - FORMWORK

.1 Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of CAN/CSA-S269.3.

.2 Fabricate and erect false work in accordance with CSA-S269.1.

.3 Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

.4 Do not place shores and mud sills on frozen ground.

.5 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.6 Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

.7 Construct formwork to maintain the maximum tolerances of concrete specified in Section 03 30 00 – Cast-in-Place Concrete.

.8 Design and install forms and shores to carry the load of the fresh concrete plus any additional loads which may be applied without settlement, lateral displacement or uplift.

.9 Align form joints and make watertight. Keep form joints to a minimum. Where concrete will be exposed in the finished work, consult with the Consultant and obtain their approval of location of joints and ties.

.10 Provide for all items to be built into the concrete.

.11 Place chamfer strips in the corners of forms to produce bevelled edges on all permanently exposed surfaces.

.12 If required, located horizontal form joints for exposed columns 2400mm (8ft) above finished floor elevation.

.13 Obtain approval before framing openings in structural members which are not indicated on Drawings.

.14 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.15 Coordinate this section with other sections of work which require attachment of components to formwork.

.16 If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Consultant.

3.4 APPLICATION - FORM RELEASE AGENT

.1 Apply form release agent on formwork in accordance with manufacturer's recommendations.

.2 Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

.3 Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings which are effected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.5 INSERTS, EMBEDDED PARTS AND OPENINGS

.1 Provide formed openings where required for items to be embedded in passing through concrete work.

.2 Locate and set in place items which will be cast directly into concrete.

.3 Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

.4 Install accessories in accordance with manufacturer's written instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.

.5 Install waterstops to manufacturer's written instructions continuous without displacing reinforcement. Heat seal joints watertight.

.6 Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

.7 Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces

3.6 FORM CLEANING

.1 Clean forms as erection proceeds, to remove foreign matter within forms.

.2 Clean formed cavities of debris prior to placing concrete.

.3 Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

.4 During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.7 FORMWORK TOLERANCES

.1 Construct formwork to maintain tolerances in accordance with CSA-A23.1.

.2 Construct and align formwork for elevator hoistway in accordance with CSA-B44.

3.8 FIELD QUALITY CONTROL

.1 Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

3.9 STRIPPING OF FORMWORK

.1 Leave formwork in place until concrete has attained sufficient strength to sustain its own weight in addition to any temporary or permanent load which may be placed on it during construction.

.1 3 days for walls.

.2 1 day (24 hours) for footings and abutments.

.3 3 days for columns.

.4 7 days for beam soffits, slabs, decks and other structural members, or 3 days when replaced immediately with adequate shoring to standard specified for falsework.

.2 The strength of concrete shall be verified by compression test results to the satisfaction of the Consultant.

.3 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later.

.4 Provide necessary reshoring of members until concrete has reached 100% of its design strength or where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

.5 Space reshoring in each principal direction at not more than 3000mm (10ft) apart.

.6 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

.7 Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

.8 Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

3.10 **FINISHING**

.1 Complete finishing of concrete per Section 03 30 00 – Cast-In-Place Concrete.

3.11 CLEAN-UP

.1 Upon completion of the work of this Section, all formwork, falsework, surplus material, debris caused by the work and equipment shall be promptly removed from the site. The building and site must be left in a condition satisfactory to the Consultant.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Labour, material and equipment for the installation of reinforcement of poured concrete foundations, retaining walls, and up-stands for patio pillars.

1.2 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forms and Accessories: General.

.2 Section 03 30 00 – Cast-in-Place Concrete: General.

.3 Section 04 05 19 – Masonry Anchorage and Reinforcement: Reinforcement for masonry.

1.3 REFERENCES

.1 ASTM A1064/A1064M-13 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

.2 ASTM A184/A184M-06 – Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.

.3 ASTM A704/A704M-06 – Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.

.4 Canadian Standards Association (CSA).

.1 CAN/CSA-A23.1-09 / A23.2-09 Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CAN3-A23.3-04 Design of Concrete Structures.

.3 CAN/CSA-G30.18-09 – Carbon Steel Bars for Concrete Reinforcement.

.4 CAN/CSA-G40.20-13/G40.21-13 – General Requirements for Rolled or Welded Structural Quality Steel.

.5 R.S.I.C. Standards

.1 RSIC - 2004 Reinforcing Steel Manual of Standard Practice.

.6 American Concrete Institute (ACI)

.1 ACI 315-99 Details and Detailing of Concrete Reinforcement.

.2 ACI 315R-99 Manual of Engineering and Placing Drawings for Reinforced Concrete.

1.4 SHOP DRAWINGS

.1 Submit copies of all shop drawings and associated bar lists required by the work of this Division, to the Consultant, for review in accordance with Section 01 33 01 – Submittal Procedures. Do NOT fabricate reinforcing until reviewed drawings have been returned to the fabricator.

.2 Prepare shop drawings according to ACI 315-99, ACI 315R-99), and the Reinforcing Steel Manual of Standard Practice issued by the Reinforcing Steel Institute of Canada.

.3 Shop drawings shall clearly indicate bar sizes, spacings, location and quantities of reinforcement, welded wire fabric, chairs, spacers and hangers with identifying code marks to permit correct placement without reference to structural drawings.

.4 Provide details to show placement of reinforcing where special conditions occur.

.5 Shop drawings shall not contain reproductions of Contract drawings.

.6 Shop drawings shall be to a minimum scale of 1:100 (1/8”=1’-0”) for plans and 1:20 (1/2”=1’-0”) for details.

.7 Bar lists shall be provided on separate A4 sized sheets (8.5" x 11") and shall include, project name, sheet number, drawing reference, bar grade, mark, quantity, size, length, type and bend information.

.8 Review of shop drawings by the Consultant is a precaution against oversight and error. It shall not be construed as relieving the Contractor of responsibility for making the work accurate and in conformity with the Contract Documents. Review is for material and general arrangement only.

.9 Upon request, provide the Consultant with a certified copy of mill tests of steel supplied, showing physical and chemical analysis.

1.5 INSPECTION AND TESTING

.1 Materials and workmanship will be subject to the inspection at any time. Co-operate in permitting access for inspection at all places where work is being done or stock is being piled prior to shipment and during erection.

.2 Where Work, in the opinion of the Consultant, requires re-inspection, or more stringent inspection because of previous requirements for re-inspection of similar work, such re-inspections or inspections shall be at the Contractor's expense.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Reinforcing steel materials shall be handled and stored on the job site in such a manner as to cause no damage to other materials, to any existing building or property or to the new structure.

.2 Materials shall not be stored so as to hinder the work of the other trades.

.3 All material shall be clearly tagged for correct identification.

.4 All material shall be stored off the ground on wood blocking. Material shall be properly protected from weather.

.5 All material shall be bundled, stacked and handled carefully so as to cause no damage or distortion.

1.7 QUALITY CONTROL

.1 Defective materials or quality of work whenever found at any time shall be rejected, regardless of previous inspection. Inspection is not to relieve the Contractor from responsibility, but is a precaution against oversight and errors. Defective materials shall be removed and replaced by this Contractor at their own expense, without change to the Contract Time.

.2 Perform work in accordance with CSA-A23.1/A23.2.

.3 Upon request inform Engineer of proposed source of material to be supplied.

Part 2 Products

2.1 REINFORCEMENT

.1 Substitute different size bars only if permitted in writing by Engineer.

.2 Reinforcing Steel, Deformed: CAN/CSA-G30.18, billet steel, Grade 400R regular bars, unfinished, unless indicated otherwise.

.3 Cold-drawn annealed steel wire ties: to ASTM A1064/A1064M.

.4 Welded steel wire fabric: to ASTM A1064/A1064M.

.1 Provide in flat sheets only.

.5 Welded deformed steel wire fabric: to ASTM A1064/A1064M.

.1 Provide in flat sheets only.

.6 Plain round bars: to CSA-G40.20/G40.21.

2.2 ACCESSORIES

.1 Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions, including load bearing pad on bottom to prevent vapour barrier puncture, where applicable. To CSA-A23.1/A23.2. Supports shall be of non-corroding type.

.2 Mechanical splices: subject to approval by Engineer.

2.3 FABRICATION

.1 Fabricate concrete reinforcing in accordance with:

.1 CSA-A23.1.

.2 RSIC - Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

.3 ACI 315R, unless indicated otherwise.

.2 Obtain Engineers approval for locations of reinforcement splices other than those shown on placing drawings.

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

Part 3 Execution

3.1 FABRICATION

.1 Fabricate reinforcing steel in accordance with the requirements of CAN/CSA-A23.1 and in strict accordance with the reviewed shop drawings and bar lists.

.2 Bends in all reinforcing steel bars shall be fabricated cold. Do not field bend bars.

.3 Locations of reinforcement splices not indicated on drawings shall be reviewed by the Consultant.

.4 Fabricate reinforcing steel within the following tolerances:

.1 Sheared length: plus or minus 25 mm (1")

.2 Stirrups, ties and spirals: plus or minus 13 mm (1/2")

.3 Other bends: plus or minus 25 mm (1")

.5 Ship bundles of bar reinforcement clearly identified in accordance with bar lists.

.6 Substitutes of different size bars will be permitted only upon written approval of the Consultant.

3.2 PLACING REINFORCEMENT

.1 Place, support and secure reinforcement against displacement to CSA-A23.1.

.2 Reinforcing steel shall be placed accurately and securely in place by the use of chairs, spacers and hangers. Special care shall be taken to see that the bars in the top of the concrete members are supported in such a manner that they will not be displaced during the depositing of concrete.

.3 Bar shall be securely tied together using 16 gauge wire. Any bars which are displaced during the depositing of concrete shall immediately be reset. Where the undersurface of the concrete is to remain exposed, precast concrete chairs shall be used.

.4 Provide and install all accessories required for supporting and positioning reinforcement in accordance with the recommendations contained in the ACI 315 Manual of Standard Practice for Detailing Reinforced Concrete Structures. Conform to the RSIC Manual of Standard Practice.

.5 Welding of reinforcing steel is not permitted.

.6 Obtain Consultant's review of reinforcing steel and placing of reinforcement prior to placing concrete.

.7 Place reinforcing steel in accordance with CAN/CSA-A23.1 and CAN3-A23.3.

.8 Do not displace or damage vapour barrier.

.9 Accommodate placement of formed openings.

3.3 CLEARANCE

.1 Preserve clear space between bars of not less than 1½ times the nominal diameter of the larger bar.

.2 In no case let the clear distance between bars be less than 40 mm (1½").

.3 Provide the following minimum concrete cover to the reinforcing steel:

.1	Concrete below grade cast against forms:	40 mm (1½")
.2	Concrete cast against soil (underside of footings):	75mm (3")
.3	As indicated on structural drawings.	

3.4 CLEANING

.1 Clean reinforcing in accordance with CAN/CSA-A23.1.

3.5 CLEAN-UP

.1 Upon completion of the work of this Section, all surplus material, debris caused by the work and equipment employed on the work of this Trade shall be promptly removed from the site. The building and site must be left in a condition satisfactory to the Consultant.

END OF SECTION

BLANK PAGE

Part 1 General

1.1 SECTION INCLUDES

.1 Cast-in-place concrete for sign foundation.

1.2 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forms and Accessories: General.

.2 Section 03 20 00 – Concrete Reinforcement: General.

1.3 CAST-IN-PLACE CONCRETE ITEMS

.1 Carefully examine the Contract Documents to ensure that all cast-in-place concrete items are provided.

.2 Provide all cast-in-place concrete items shown on the structural drawings, other drawings, and as specifically mentioned in this specification, including but not limited to the following:

- .1 Placing of all concrete foundations, walls, piers and toppings;
- .2 Installation of inserts, anchors, sleeves, waterstops and similar items and building-in of items supplied under other Sections;
- .3 Cold weather protection;
- .4 Hot weather protection;
- .5 Curing of concrete.
- .6 Anchors, bolts, hangers, sleeves, ties, inserts and other items to be cast into concrete are to be supplied by applicable trades.

1.4 REFERENCES

.1 ACI 305R-05 - Hot Weather Concreting.

.2 ACI 306R-88(2002) - Cold Weather Concreting.

.3 ASTM C260-10a - Air-Entraining Admixtures for Concrete.

.4 ASTM C330-09 - Lightweight Aggregates for Structural Concrete.

.5 ASTM C494/C494M-08a - Chemical Admixtures for Concrete.

.6 CAN/CSA-S269.3-M92 (R2008) - Concrete Formwork.

.7 CAN/CSA-S474-04 (R2009) - Concrete Structures.

.8 CSA-A23.1-09/A23.2-09 - Concrete Materials and Methods of Concrete Construction / Methods of Test and Standard Practices for Concrete.

.9 CSA-A23.3-04 - Design of Concrete Structures.

.10 CSA-S269.1-1975 (R2003) - Falsework for Construction Purposes.

.11 R.S.I.C. Standards

.1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide data on joint devices, attachment accessories and admixtures.

.3 Samples: Submit two (2) samples and product data sheet for concrete sealer, expansion and control joint material and waterstops.

1.6 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Test Data: Minimum four (4) weeks prior to starting concrete work, submit manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:
.1 Portland cement.
.2 Blended hydraulic cement.
.3 Supplementary cementing materials.
.4 Grout.
.5 Admixtures.
.6 Aggregates.
.7 Water.

.3 Certification: Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CSA-A23.1.

.4 Certification: Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CSA-A23.1.

.5 Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent Work.

.6 Submit testing and inspection results and reports for review by Engineer and do not proceed without written approval when deviations from mix design or parameters are found.

.7 Concrete hauling time: submit for review by Engineer deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site or Work and discharged after batching.

1.7 CLOSEOUT SUBMITTALS

.1 Section 01 33 00: Submittal procedures.

.2 Record Documentation: Accurately record actual locations of embedded utilities and components.

1.8 QUALITY ASSURANCE

.1 Perform Work in accordance with CSA-A23.1/A23.2.

.2 Acquire cement and aggregate from same source for all work.

.3 Submit to Engineer, a minimum 4 weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.4 Conform to CSA-A23.1 when concreting during hot and cold weather.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Store material in accordance with CAN/CSA-A23.1.

.2 Concrete hauling time: maximum allowable time limit for concrete to be delivered to site of Work and discharged not to exceed 120 minutes after batching.

.1 Modifications to maximum time limit must be agreed to by Engineer and concrete producer as described in CSA-A23.1/A23.2.

.2 Deviations to be submitted for review by Engineer.

.3 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

.4 Cement and aggregate shall be stored in such a manner as to prevent deterioration or intrusion of foreign matter. Liquid mixtures shall be protected from freezing and from setline out of solution. Any deteriorated or damaged materials shall not be used for concrete.

1.10 INSPECTION AND TESTING

.1 An independent inspection and testing company representing and appointed by the Owner may carry out inspection and testing as required.

.2 The contractor shall arrange with the inspector and the Owner's representative for review of construction.

.3 Tests will be carried out under the appropriate CSA standards and as directed by the Consultant.

~~.4 A minimum of three (3) compression test specimens are to be taken for each concrete placement, but not less than three (3) cylinders for each 40 cubic metres of individual placement, all in accordance with CAN/CSA-A23.2. One (1) cylinder shall be tested at seven (7) days and the remaining cylinders at twenty-eight (28) days. Additional test specimens shall be taken at the discretion of the Consultant. Preparation of test cylinders, curing procedure and testing, shall all be carried out by the Inspection and Testing Company.~~

~~.1 A copy of all test results are to be forwarded directly to the Engineer and Architect, by the Inspection and Testing Company.~~

.5 Materials and workmanship will be subject to the inspection at any time. Co-operate in permitting access for inspection at all places where work is being done or stock is being stored.

.6 The Contractor shall supply all necessary samples to the Testing Laboratory for testing. Supply additional labour required to assist the Testing Laboratory in making such tests. The cost of this material and labour shall be born by the Contractor.

.7 Where Work, in the opinion of the Consultant, requires re-inspection, or more stringent inspections because of previous requirements of re-inspections of similar work, such re-inspections or inspections shall be at the Contractor's expense.

1.11 SCHEDULING

.1 Check the drawings and specifications for the requirements of other trades which will affect the forming and placing of concrete and reinforcing steel.

.2 Give instruction and information in writing, or by schedule to other trades, of the requirements necessary for services, materials, or inserts prepared and/or supplied by other trades which will affect the work of this division.

.3 Prior to placing concrete, request review of formwork and reinforcing steel by the Engineer. Concrete shall not be placed until the Engineer has completed the review.

.4 Before placement, all equipment for mixing and transporting the concrete shall be cleaned, and all debris and ice shall be removed from the places to be occupied by concrete. Reinforcement shall be thoroughly cleaned of ice, dirt, scale or other coatings.

1.12 COOPERATION WITH OTHER TRADES

.1 Set sleeves, ties, anchor bolts, pipe hangers and other inserts, openings and sleeves in concrete work, as required by other Sections.

.2 Read the specifications and examine the drawings covering the work of other interfacing trades. Consult with the trades concerned to give them all necessary facilities and directions and information to complete the work of their trade.

.3 Confine operations to the immediate vicinity of the item’s final location in the Work, and co-operate fully in order to permit work adjacent to or appurtenant to the work to be carried out with a minimum of interference.

1.13 DELIVERY, STORAGE AND HANDLING

.1 Store material in accordance with CAN/CSA-A23.1.

.2 Cement and aggregate shall be stored in such a manner as to prevent deterioration or intrusion of foreign matter. Liquid mixtures shall be protected from freezing and from settling out of solution. Any deteriorated or damaged materials shall not be used for concrete.

.3 Concrete shall be delivered to the site and discharged in accordance with the requirements of CAN/CSA-A23.1

1.14 QUALITY CONTROL

.1 Defective materials or quality of work whenever found at any time shall be rejected, regardless of previous inspection. Inspection is not to relieve the Contractor from responsibility, but is a precaution against oversight and errors. Defective materials shall be removed and replaced by the Contractor at their own expense, and without change to the Contract Time.

1.15 ENVIRONMENTAL CONDITIONS

.1 Cold Weather Requirements

.1 When the air temperature is at or below 5 degrees Celsius or when there is a probability of it falling to that limit within 24 hours of placing, the concrete temperature shall be maintained in accordance with CAN/CSA-A23.1.

.2 Ensure that the surface on which finished slabs and toppings are placed, including soil, is at a temperature of at least +13 degrees Celsius. Ensure that any surface against which concrete is to be placed, including soil, is at a temperature of at least +5 degrees Celsius.

.3 In cold weather, concrete shall be delivered to the work having a temperature of not less than 18 degrees Celsius and not more than 32 degrees Celsius.

.4 Provide temporary heating equipment in accordance with Section 01500. Exhaust heaters producing carbon dioxide shall be vented directly to the outside. Protect concrete surfaces from direct exposure to the combustion gases of heaters.

.5 Provide protection for concrete such that all sections of the concrete and surrounding air will remain continuously at a temperature of between +10 degrees Celsius and +20 degrees Celsius for 5 days after placing.

.6 The housing, covering or other protection used in connection with curing shall remain in place and intact at least twenty-four hours and until the air temperature in the enclosure has reached the outside air temperature after the artificial heating is discontinued. No dependence shall be placed on salt or other chemicals for the prevention of freezing.

.2 Hot Weather Requirements

.1 When the air temperature is at or above 25 degrees Celsius or when there is a probability of it rising to 25 degrees Celsius during the placing period, special effort shall be made to maintain the concrete temperature in accordance with CAN/CSA-A23.1 Curing and Protection.

.2 Water down all formwork, steel deck, reinforcing, sub-grade and general area around the Work just before placing concrete to reduce the temperature and increase the humidity. Do not permit water to puddle.

.3 In hot weather concrete shall be delivered to the work having a temperature of not less than 10 degrees Celsius and not more than 27 degrees Celsius.

.4 Take suitable precautions to avoid drying of the concrete prior to finishing operations. Provide windbreaks, sunshades, fog sprays or other devices.

.5 Do not place concrete which has a temperature of 32 degrees Celsius or above.

Part 2 Products

2.1 MATERIALS

.1 Cement: CSA-A3001, Type GU. All cement shall be of the same brand and by the same manufacturer throughout the Contract unless otherwise approved by the Consultant.

.2 Blended Hydraulic Cement: CSA-A3001, Type GUb or GU.

.3 Water: CSA-A23.1, clean and not detrimental to concrete.

.4 Reinforcing bars: to CAN/CSA-G30.18, Grade 400R.

.5 Welded steel wire fabric: to ASTM A185.

.6 Premoulded joint filler:
- .1 Bituminous impregnated fibreboard: to ASTM D1751.

.7 Joint sealer/filler: grey to CAN/CGSB-19.24, Type 1, Class B.

.8 Shrinkage compensating grout: premixed compound consisting of metallic and/or non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA-A23.1/A23.2.
- .1 Compressive strength: 35 MPa at 28 days.
- .2 Net shrinkage at 28 days: maximum 0.1%.

.9 Non-premixed dry pack grout: composition of non-metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of 35 MPa at 28 days.

.10 Water-Reducing Agent: to CAN3-A266.2, Type WN

.11 Chemical admixture: to CAN3-A266.3. Calcium chloride and admixtures containing calcium chloride shall not, under any circumstances, be added to any concrete mix.

.12 Pozzolanic mineral concrete: to CAN3-A266.3.

- .1 Fly ash not permitted. Maximum slag content not to exceed 15% of cementitious material.

.13 Ready-mixed concrete: to CAN/CSA-A23.1 and the requirements of these Specifications.

.14 Waterstops: PVC Waterstop by W.R. Meadows, or approved alternative.

.15 Granular Fill: approved Granular 'A' material conforming to OPSS No. 1010.

.16 Vapour Barrier: 0.25 mm (10 mil) polyethylene sheet.

.17 Saw Cut Filler: Rezi-Weld Flex – Semi-Rigid Epoxy Joint Filler, by W.R. Meadows.

.18 Isolation Joint: CERAMAR – Flexible Foam Expansion Joint, by W.R. Meadows.

.19 Concrete Sealer: Linseed Oil, by Euclid Chemical.

.20 Other materials not listed herein but required for proper completion of the work shall conform with the latest CSA, ASTM and CGSB Standards appropriate to those materials and are subject to the advanced approval of the Consultant.

2.2 MIXES

.1 Performance Method for specifying concrete: to meet Engineers performance criteria in accordance with CAN/CSA-A23.1/A23.2.

.1 Ensure concrete supplier meets performance criteria.

.2 If requested, provide concrete supplier's certification.

.3 Provide quality management plan to ensure verification of concrete quality to specified performance.

2.3 ADMIXTURES

.1 Admixtures will be permitted, as specified, only to correct deficiency in mixture or to make correct placement requirements as recommended by the Testing Laboratory and approved by the Consultant.

.2 Approval will be withdrawn of the use of the admixture, if, during the course of the work, concrete performance appears unsatisfactory.

.3 Accelerating admixtures may be used subject to approval in cold weather. If approved, the use of admixture will not relax the cold weather placement requirements of CAN/CSA-A23.1.

.4 Set-retarding admixture may be used subject to approval during hot weather to allow for proper finishing of concrete.

.5 For all concrete exposed to weather provide air entrainment as per Table 10 of CAN/CSA A.23.1. or as indicated on Structural Drawings.

Part 3 Execution

3.1 EXAMINATION

.1 Verify existing conditions before starting work.

.2 Verify all dimensions and locations required on drawings.

.3 Verify requirements for concrete cover over reinforcement.

.4 Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not impede concrete placement.

.5 Verify locations of all openings and embedments required for other structural, architectural, mechanical and electrical work.

3.2 PREPARATION

.1 Place concrete reinforcing in accordance with Section 03 20 00 and drawings.

.2 During concreting operation:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.3 Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

3.3 PLACING CONCRETE

.1 Place concrete in accordance with CSA-A23.1.

.2 Notify Consultant minimum 48 hours prior to commencement of operations.

.3 Obtain Consultant's review of forms and reinforcing before placing any concrete.

.4 Do not place concrete during or prior to rain. If rain occurs after placing and before initial set of concrete, cover with a waterproof material until set.

.5 Unless otherwise agreed by the Consultant, consolidate all concrete in place by means of internal vibrators. Use the largest vibrator consistent with the type and location of concrete being placed. Vibrators shall be in accordance with CAN/CSA-A23.1, Table 17.

.6 Apply vibrators systemically and at such spacing that the zones of influence overlap. Do not over-vibrate.

.7 Concrete shall be thoroughly worked around reinforcement and embedded items and into the corners of forms.

.8 Ensure reinforcement, inserts, embedded parts and formed expansion/contraction joints are not disturbed during concrete placement.

.9 Methods of conveying and placing are to be such that concrete components do not segregate. Do not use vibrators to convey concrete.

.10 Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to re-handling or flowing. The placing of concrete shall be carried on at such a rate that concrete is at all times plastic and flows readily into spaces between bars. No concrete that has been contaminated by foreign material shall be used.

.11 Once the placing of concrete has started, it shall be carried on as a continuous operation until the placement of the panel or section is complete.

.12 The time between adding mixing water to the ready-mix concrete at the ready-mix plant, until the discharge of concrete into final location, must not exceed 1½ hours.

.13 Concrete shall be homogenous, uniformly workable, and readily placeable into corners and angle of forms and around reinforcement, without permitting materials to segregate, or excessive free water to collect on surface.

.14 Concrete, when hardened, shall have required strength, durability, resistance to abrasion, water tightness, appearance and other qualities specified or noted.

.15 Water Stops.

.1 Install water stops to provide continuous watertight seal.
.2 Do not distort or pierce water stop in such a way as to hamper performance.
.3 Do not displace reinforcement when installing water stops.
.4 Use equipment to manufacturer's requirements to field splice water stops.
.5 Tie water stops rigidly in place.
.6 Use only straight heat sealed butt joints in field.
.7 Use factory welded corners and intersections.

.16 Separate slabs on grade from vertical surfaces with 13 mm (1/2") thick joint filler.

.17 Set top of joint filler to required elevations. Secure to resist movement by wet concrete.

.18 Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

.19 Place concrete continuously between predetermined expansion, control, and construction joints.

.20 Do not interrupt successive placement; do not permit cold joints to occur.

.21 Where indicated, saw cut joints within 24 hours after placing. Refer to structural drawings for depth and spacing of saw cuts.

3.4 TOLERANCES

.1 Slab and Floor Tolerances: Specified in Section 03 35 00.

3.5 CONCRETE FINISHING

.1 Finish all concrete to CSA-A23.1-A23.2.

.2 Patch all tie holes, cut out areas and cavities, per CSA-A23.1/A23.2 clause 7.7.2.

.3 Non-exposed / Non-'architectural' concrete: finish to smooth-form finish.

.4 Pavements, walks, curbs and exposed site concrete:
.1 Screed to plan surfaces and use aluminum, magnesium or wood floats.
.2 Provide round edges and joint spacings using standard tools.
.3 Trowel smooth to provide lightly brushed non-slip finish.

3.6 CURING AND PROTECTION

.1 Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical damage.

.2 Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.7 FIELD QUALITY CONTROL

.1 Provide free access to Work and cooperate with appointed firm.

.2 Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.

.3 Tests of cement and aggregates may be performed to ensure conformance with specified requirements.

.4 Testing in accordance with CAN/CSA-A23.1/A23.2 by testing laboratory.

3.8 PATCHING

.1 Allow Consultant to inspect concrete surfaces immediately upon removal of forms.

.2 Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Consultant upon discovery.

.3 Patch imperfections in accordance with CSA 23.1.

3.9 DEFECTIVE CONCRETE

.1 Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

.2 Repair or replacement of defective concrete will be determined by the Consultant.

.3 Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Consultant for each individual area.

3.10 GROUTING

.1 Grouting of steel base plates, wherever required, shall be with non-shrink grout, in accordance with the manufacturer's instructions.

3.11 SEALANT

.1 Verify substrate has properly cured, obtaining 80% design strength.

.2 Ensure crack control, caulking, patching and expansion joint sealants are installed prior to application of sealer. Allow adequate curing time.

.3 Clean all surfaces of all sand, surface dust, dirt, oil, grease, chemical films or coatings and other contaminants prior to application.

.4 Apply sealer only in environmental conditions as recommended by manufacturer.

.5 Apply sealer in accordance with manufacturer's instructions.

.6 Clean all spills in a timely manner, ensuring spills are not allowed to site for extended periods of time.

3.12 PROTECTION

.1 Protect all exposed concrete work from staining and/or physical damage to structural integrity or finish.

.2 Replace damaged work which cannot be repaired or restored to the Consultant's approval.

3.13 CLEAN-UP

.1 Upon completion of the Work of this Section, all surplus material, debris caused by the work and equipment shall be promptly removed from the site. The building and site must be left in a condition satisfactory to the Consultant.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 01 – Submittal Procedures.

.2 Section 03 20 00 – Concrete Reinforcement.

.3 Section 03 30 00 – Cast-In-Place Concrete.

.4 Section 04 05 12 – Masonry Mortar and Grout.

.5 Section 04 05 19 – Masonry Anchorage and Reinforcing.

.6 Section 04 21 13 – Veneer Masonry

1.2 REFERENCES

.1 Canadian Standards Association (CSA International).

- .1 CSA-A165 Series-04, Standards on Concrete Masonry Units.
- .2 CSA A179-04, Mortar and Grout for Unit Masonry.
- .3 CSA-A371-04, Masonry Construction for Buildings.

1.3 SUBMITTALS

.1 Product Data.

- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 01 - Submittal Procedures.

.2 Samples.

- .1 Submit samples in accordance with Section 01 33 01 - Submittal Procedures.
- .2 Submit samples.
  - .1 Six of each type of masonry unit specified.
  - .2 Two of each type of masonry accessory specified.
  - .3 One of each type of masonry reinforcement, tie and connector proposed for use.
- .3 Submit manufacturer's data and colour sample of concrete block, sample of sill units, and full sized samples of all clay and pre-cast concrete masonry veneer units, in each colour and finish.
- .4 Submit sieve analysis for brick sand, and for lime.
- .5 Submit samples to be tested to laboratories employing technicians certified/trained in procedures for testing masonry units.

.3 Manufacturer's Instructions.

- .1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Test Reports.

.1 Certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Submit laboratory test reports certifying compliance of masonry units and mortar ingredients with specification requirements.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Mock-ups.

.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock-up panel of exterior masonry wall construction 3600 x 2400 mm showing masonry colours and textures, use of reinforcement, ties, through-wall flashing, weep holes, jointing, coursing, mortar and workmanship.

.3 Mock-up will be used:

.1 To judge workmanship, substrate preparation, operation of equipment and material application.

.2 For testing to determine compliance with performance requirements. Perform following tests.

.1 For clay units, in addition to requirements set out in referenced CSA and ASTM Standards include data indicating initial rate of absorption.

.4 Construct mock-up where directed.

.5 Allow for inspection of mock-up by Consultant before proceeding with work.

.6 When accepted by Consultant, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

.4 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store, handle and protect materials in accordance with manufacturer’s instructions.

.2 Deliver materials to job site in dry condition.

.3 Storage and Protection.

.1 Keep materials dry until use except where wetting of bricks is specified.

.2 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 In accordance with Construction / Demolition Waste Management Plan.

.2 Separate and recycle waste materials.

.3 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.4 Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard packaging material for recycling.

.5 Unused metal materials are to be diverted from landfill to a metal recycling facility.

.6 Unused or damaged masonry materials are to be diverted from landfill to a local quarry facility.

1.7 SITE CONDITIONS

.1 Site Environmental Requirements.

.1 Cold weather requirements.

.1 Supplement Clause 5.15.2 of CSA-A371 with following requirements.

.1 Maintain temperature of mortar between 5 °C and 50 °C until batch is used or becomes stable.

.2 Maintain ambient temperature between 5 °C and 50 °C and protect worksite from excessive wind chill.

.2 Hot weather requirements.

.1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

.2 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.

Part 2 Products

2.1 MATERIALS

.1 Masonry materials are specified in Related Sections.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 PREPARATION

.1 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place. Submit certified shop drawings of bracing in accordance with Section 01 33 00 – Submittal Procedures.

3.3 INSTALLATION

.1 Do masonry work in accordance with CSA-A371 except where specified otherwise.

.2 Build masonry plumb, level, and true to line, with vertical joints in alignment. Assume complete responsibility for dimensions, plumbs and levels of the work and constantly check the same.

.3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

.4 Provide all necessary or required temporary bracing for masonry work and leave in place until permanent lateral support is in place.

3.4 CONSTRUCTION

.1 Exposed masonry.

.1 Remove chipped, cracked, and otherwise damaged units, in accordance with CSA A-165, Clause 82.1, in exposed masonry and replace with undamaged units.

.2 Jointing.

.1 Allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, joints true to line, compressed, uniformly concave joints where concave joints are indicated or unless noted otherwise.

.2 Allow joints to set just enough to remove excess water, then rake joints uniformly to 6 mm (1/4”) depth and compress with square tool to provide smooth, compressed, raked joints of uniform depth where raked joints are indicated.

.3 Strike flush joints concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating.

.3 Cutting.

.1 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.

.2 Make cuts straight, clean, and free from uneven edges.

.4 Building-In.

.1 Cooperate with other trades with respect to building in items supplied by others.

.2 Build in items required to be built into masonry. Protect built in items from damage.

.3 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.

.4 Build-in loose lintels and inserts required to be built into masonry, as work progresses.

.5 Wetting of bricks.

.1 Except in cold weather, wet bricks having an initial rate of absorption exceeding 1 g/minute/1000 mm^2: wet to uniform degree of saturation, 3 to 24 hours before laying, and do not lay until surface dry.

.2 Wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.

.6 Weather Requirements

.1 When temperature is less than 5 °Celsius, provide heated mortar.

.2 In cold weather provide gas fired aggregate heater and heated water to deliver mixed mortar at 20 °Celsius. Do not scorch aggregate.

.3 Mortar to be at least 5 °Celsius when used. Use within 2½ hrs. of mixing.

.4 Protect masonry from freezing with heat and enclosure for 48 hours after units are laid.

.5 In hot or very dry weather, protect mortar from rapid drying with polyethylene coverings or water mist.

.7 Support of loads.

.1 Use 30 MPa concrete in accordance with Section 03 30 00 - Cast-in-Place Concrete, where concrete fill is used in lieu of solid units.

.2 Use grout to CSA A179 where grout is used in lieu of solid units.

.3 Install building paper below voids to be filled with concrete or grout; keep paper 25mm (1") back from faces of units.

.8 Provision for movement.

.1 Leave 25mm (1") space between top of non-loadbearing walls and partitions and structural elements, floor and roof construction. Do not use wedges. Install Roxul mineral wool insulation for gap filler.

.2 Leave 10mm space below shelf angles. Fill with joint filler

.3 Build masonry to tie in with stabilizers, with provision for vertical movement.

.9 Loose steel lintels.

.1 Install loose steel lintels. Centre over opening width. Refer also to drawings.

.10 Control joints.

.1 Construct continuous control joints minimum 4,000 mm O.C. or as indicated on drawings.

.2 Course brick to vertical joint, fill joint with joint filler and caulk with selected colour of sealant.

.3 In concrete block, provide building paper divorce sheet and fill joint full of mortar to provide shear key.

.11 Expansion joints.

.1 Build-in continuous expansion joints as indicated.

.12 Interface with other work.

.1 Cut openings in existing work as indicated.

.2 Openings in walls: approved by Engineer.

.3 Make good existing work. Use materials to match existing.

.13 Corners of bearing and non-bearing walls are to be tied with reinforcement.

.14 Re-tempering will not be permitted.

.15 Mortar joints, horizontal and vertical, to be +/- 10mm (3/8”). Variance of more than 2mm (5/64”) will not be accepted and will be rejected.

.16 Masonry to have tooled joints, unless noted otherwise.

3.5 SITE TOLERANCES

.1 Tolerances in notes to Clause 5.3 of CSA-A371 apply.

3.6 FIELD QUALITY CONTROL

.1 Inspection and testing will be carried out by certified and approved Testing Laboratory.

3.7 CLEANING

.1 Clean exposed masonry daily.

.2 Protect other work from damage during masonry cleaning.

.3 Clean a small portion of masonry and wait one week to check for harmful effects before proceeding.

.4 Clean completed masonry work by removing large particles with wood paddles; clean with pressurized water spray (Approx. 400 psi) in accordance with manufacturer's recommendations.

.5 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.6 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.8 PROTECTION

.1 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

END OF SECTION

BLANK PAGE

Part 1 General

1.1 RELATED SECTIONS

.1 Section 04 05 10 – Common Work Results for Masonry.

.2 Section 04 21 13 – Veneer Masonry.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International).

.1 CSA A179-04(R2004), Mortar and Grout for Unit Masonry.

1.3 SUBMITTALS

.1 Product Data.

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 01 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 01 - Submittal Procedures. Indicate VOC's mortar, grout, parging, colour additives and admixtures.

.2 Samples.

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

.2 Submit two brick size samples of all types of mortar.

.3 Manufacturer's Instructions.

.1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.1 Submit laboratory test reports in accordance Section 01 33 01 – Submittal Procedures.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard packaging material in appropriate on-site for recycling.

Part 2 Products

2.1 MATERIALS

.1 Use same brands of materials and source of aggregate for entire project.

.2 Mortar and grout: CSA A179.

.3 Use aggregate passing 1.18 mm sieve where 6mm (1/4") thick joints are indicated.

.4 Colour: ground coloured natural aggregates or metallic oxide pigments, colour selected by Consultant.

~~.5 Mortar for foundation walls, manholes, sewers, pavements, walks, patios and other exterior masonry at or below grade: type M based on Property specifications.~~

~~.6 Mortar for interior masonry.~~

~~.1 Loadbearing: type S based on Property specifications.~~

~~.2 Non-Loadbearing: type N based on Proportion specifications.~~

~~.7 Mortar for exterior cavity wall block~~

~~.1 Loadbearing: type S.~~

.8 Following applies regardless of mortar types and uses specified above:

- .1 Mortar for calcium silicate brick and concrete brick: type O based on Proportion specifications.
- .2 Mortar for stonework: type N based on Proportion specifications.
- .3 Mortar for grouted reinforced masonry: type S based on Proportion specifications.
- .4 Mortar for pointing: type S based on Proportion specifications.

.9 White mortar: use white Portland cement, and lime to produce mortar type specified.

.10 Coloured mortar: use colouring admixture not exceeding 10% of cement content by mass, or integrally coloured masonry cement, to produce coloured mortar to match approved sample, colour selected by Consultant.

.11 Non-Staining mortar: use non-staining masonry cement for cementitious portion of specified mortar type.

.12 Grout: to CSA A179, Table 3.

.13 Parging mortar: type N to CSA A179.

.14 Water: Clean, free of deleterious acids, alkali, salt or organic materials.

.15 Sand:

.1 Washed, clean, sharp, free of deleterious substances.

.2 Grade in accordance with CSA Spec. A82.

.16 Lime: Hydrated lime CSA A82.

2.2 MIXES

.1 Colour and admixtures: mix grout to semi-fluid consistency.

.2 Coloured mortars: incorporate colour and admixtures into mixes in accordance with manufacturer's instructions.

.1 Use clean mixer for coloured mortar.

.3 Pointing mortar: pre-hydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour nor more than 2 hours then remix with sufficient water to produce mortar of proper consistency for pointing.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 CONSTRUCTION

.1 Do masonry mortar and grout work in accordance with CSA A179 except where specified otherwise.

.2 Apply parging in uniform coating not less than 10 mm (3/8”) thick, where indicated.

3.3 CLEANING

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

3.4 SCHEDULE

.1 Mortar colour schedule:

.1 Veneer: To be Determined

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 01 – Submittal Procedures.

.2 Section 03 20 00 – Concrete Reinforcement.

.3 Section 04 05 10 – Common Work Results for Masonry.

.4 Section 04 05 12 – Masonry Mortar and Grout.

.5 Section 04 21 13 – Veneer Masonry

1.2 REFERENCES

.1 Canadian Standards Association (CSA International).

- .1 CAN/CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
- .2 CSA-A370-04(R2004), Connectors for Masonry.
- .3 CSA-A371-04(R2004), Masonry Construction for Buildings.
- .4 CSA G30.14-M1983 (R1998), Deformed Steel Wire for Concrete Reinforcement.
- .5 CAN/CSA G30.18-R2002, Billet-Steel Bars for Concrete Reinforcement.
- .6 CSA-S304.1-04(R2004), Masonry Design for Buildings.
- .7 CSA A179-04, Mortar and Grout For Unit Masonry.
- .8 CSA W186-M1990 (R1998), Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.3 SUBMITTALS

.1 Product Data:

- .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 01 - Submittal Procedures.
- .2 If requested, submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 01 - Submittal Procedures. Indicate VOC's for epoxy coatings and galvanized protective coatings and touch-up products.

.2 Shop Drawings:

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop drawings consist of bar bending details, lists and placing drawings.
- .3 On placing drawings, indicate sizes, spacing, location and quantities of reinforcement and connectors.

.3 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.4 Submit one of each type of masonry reinforcement, tie, connector and fasteners proposed for use.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard packaging material for recycling.

.4 Divert unused metal materials from landfill to metal recycling facility.

Part 2 Products

2.1 MATERIALS

.1 Bar reinforcement: to CSA-A371 and CAN/CSA G30.18, Grade 400.

.2 Wire reinforcement: to CSA-A371 and CSA G30.14, ladder type.

.3 Connectors: to CSA-A370 and CSA-S304.

.4 Corrosion protection: to CSA-S304, galvanized to CSA-S304 and CSA-A370.

2.2 FABRICATION

.1 Fabricate reinforcing in accordance with CAN/CSA-A23.1 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Ontario.

.2 Fabricate connectors in accordance with CSA-A370.

.3 Obtain Engineers approval for locations of reinforcement splices other than shown on placing drawings.

.4 Upon approval of Engineer, weld reinforcement in accordance with CSA W186.

.5 Ship reinforcement and connectors, clearly identified in accordance with drawings.

2.3 SOURCE QUALITY CONTROL

.1 Upon request, provide Engineer with certified copy of mill test report of reinforcement steel and connectors, showing physical and chemical analysis, minimum five (5) weeks prior to commencing reinforcement work.

.2 Upon request, inform Engineer of proposed source of material to be supplied.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 GENERAL

.1 Supply and install masonry connectors and reinforcement in accordance with CSA-A370, CSA-A371, CAN/CSA-A23.1 and CSA-S304.1 unless indicated otherwise.

.2 Prior to placing concrete, mortar, or grout, obtain Engineer’s approval of placement of reinforcement and connectors.

.3 Supply and install additional reinforcement to masonry as indicated.

3.3 BONDING AND TYING

.1 Bond walls of two or more wythes using metal connectors in accordance with CSA-S304, CSA-A371 and as indicated.

.2 Tie brick veneer to backing in accordance with NBC, CSA-S304.1, CSA-A371 and as indicated.

3.4 SHELF ANGLES

.1 Install shelf angles in accordance with the structural and architectural details and as required over mechanical openings.

.2 Place and grout reinforcement in accordance with CSA-S304.1, CSA-A371, and CSA-A179.

3.5 GROUTING

.1 Grout masonry in accordance with CSA-S304.1, CSA-A371 and CSA-A179 and as indicated on drawings.

3.6 ANCHORS

.1 Supply and install metal anchors as indicated.

3.7 LATERAL SUPPORT AND ANCHORAGE

.1 Supply and install lateral support and anchorage in accordance with CSA-S304.1 and as indicated on drawings.

3.8 MOVEMENT JOINTS

.1 Reinforcement will not be continuous across movement joints unless otherwise indicated.

3.9 REINFORCEMENT

.1 Install masonry reinforcement in accordance with Section 04 21 13 –Veneer Masonry, or as indicated on drawings.

~~.2 Grout and reinforce all cores of concrete block with reinforcing steel bars, anchor rods, embedments where indicated on drawings.~~

3.10 FIELD BENDING

.1 Do not field bend reinforcement and connectors except where indicated or authorized by Engineer.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars and connectors which develop cracks or splits.

3.11 FIELD TOUCH-UP

.1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcement steel and connectors with compatible finish to provide continuous coating.

3.12 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 01 – Submittal Procedures.

.2 Section 04 05 10 – Common Work Results for Masonry.

.3 Section 04 05 12 – Mortar and Masonry Grout.

.4 Section 04 05 19 – Masonry Anchorage and Reinforcing.

1.2 REFERENCES

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

.1 ASTM C126, Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.

.2 Brick Industry Association (BIA).

.1 Technical Note No. 20-2000, Cleaning Brick Masonry.

.3 Canadian Standards Association (CSA International).

.1 CAN/CSA A82.1-M06(R2006), Burned Clay Brick (Solid Masonry Units Made From Clay or Shale).

.2 CSA A82.3-06, Calcium Silicate (Sand-Lime) Building Brick.

.3 CAN3-A82.8-06, Hollow Clay Brick.

.4 CSA-A165 Series-04, CSA Standards on Concrete Masonry Units.

1.3 SUBMITTALS

.1 Product Data.

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 01 - Submittal Procedures.

.2 Manufacturer's Instructions.

.1 Submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 - Waste Management And Disposal: GM Frost or as directed by Consultant.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

Part 2 Products

2.1 MANUFACTURED UNITS

.1 Locations of unit masonry types is as indicated on the Drawings.

.2 Masonry Veneer: To be confirmed by Client

.1 Owen Sound Ledgerock Ltd
Size: Height/Thickness: 2" (10%), 4" (40%), 7" (40%), 12" (10%). Width/Length: bed width of 4". Random lengths with split face.
Colour: Wiarton Grey
Product: Natural Bed Ledgerock Wall Stone
Finish: Split Face (max. face rise 50mm), sides & back to be sawn cut
Pattern: Random laid ashlar dry-stack look, where all mortar joints are deeply raked to 1" (25mm) deep, but still weatherproof. Maximum mortar joint thickness is to be 3/8" (8mm).

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

.1 Lay out coursing and bond to achieve correct coursing heights and continuity of bond above and below openings. Align and/or stagger vertical and horizontal joints above and beside adjacent stone to achieve "random" pattern in accordance with APPROVED sample / mock-up wall section.

.2 Lay units in a full bed of mortar. Tool mortar to achieve joints as directed by the Consultant.

.3 Trim / Banding Stone and Precast Joints: pressed / compacted and tooled concave smooth.

.4 Tool all joints in all concrete block walls, even if concealed.

.5 Do not tooth new masonry. Step back diagonally or lay temporary half-units as spacers.

.6 Contractor to use

.1 "Drop boards" to ensure that cavity behind masonry exterior wythe is kept clean and free from mortar droppings and

.2 Cavity drainage protection: Driwall Mortar Deflection 1.0-075 by Keene Building Products or approved alternate.

.7 Bond: stretcher.

.8 Coursing height: N / A.

.9 Interior Jointing: N / A

.10 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.

.11 Clean unglazed clay masonry as work progresses.

3.3 ANCHORAGE

.1 Veneer to be tied back to concrete wall structure through airspace cavity with stainless steel ties or approved alternate.

.2 Veneer ties to be installed at maximum spacing of 200mm vertical and 400mm horizontal.

3.4 CLEANING

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 Clean unglazed clay masonry: mock-up panel specified in Section 04 05 10 - Common Work Results for Masonry as directed below and leave for one week. If no harmful effects appear and after mortar has set and cured, protect windows, sills, doors, trim and other work, and clean brick masonry as follows.

.1 Remove large particles with wood paddles without damaging surface. Saturate masonry with clean water and flush off loose mortar and dirt.

.2 Scrub with solution of 25 mL trisodium phosphate and 25 mL household detergent dissolved in 1 L of clean water using stiff fibre brushes, then clean off immediately with clean water using hose. Alternatively, use proprietary compound recommended by brick masonry manufacturer in accordance with manufacturer's directions.

.3 Repeat cleaning process as often as necessary to remove mortar and other stains.

.4 Use acid solution treatment for difficult to clean masonry as described in Technical Note No.20 by the Brick Industry Association.

.3 Clean concrete masonry units as work progresses.

.1 Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of brick and finally by brushing.

.4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 OESC – Ontario Electrical Safety Code (Latest Edition).

.2 OBC – Ontario Building Code

1.2 PERMITS, FEES AND INSPECTION

.1 Submit permit application to Electrical Safety Authority (ESA).

.2 Pay associated fees.

.3 Owner will provide drawings and specifications required by Electrical Safety Authority at no cost.

.4 Notify Owner of changes required by Electrical Safety Authority prior to making changes.

.5 Furnish Certificates of Acceptance from Electrical Safety Authority on completion of work to Owner.

1.3 INSPECTION OF WORK

.1 The Owner will make periodic visits to the site during construction to ascertain reasonable conformity to plans and specifications but will not execute quality control. The Contractor shall be responsible for the execution of his work in conformity with the construction documents and with the requirements of the inspection authority.

1.4 SCHEDULING OF WORK

.1 Work shall be scheduled in phases as per other divisions of the architectural specifications.

.2 Become familiar with the phasing requirements for the work and comply with these conditions.

.3 No additional monies will be paid for contractor's requirement to comply with work phasing conditions.

1.5 FIRE RATING OF PENETRATIONS

.1 Maintain fire ratings around conduits passing through floors, ceilings and fire rated walls.

.2 Use 3M brand or equal fire barrier products at each penetration.

.3 Acceptable products for fire barrier products shall be 3M #CP25 fire barrier caulk, #303 putty, #FS 195 wrap and #CS195 sheet.

.4 Acceptable manufacturers: Nelson, Fire Stop Systems, 3M or approved equal. Material of same manufacturer to be used throughout project.

1.6 ACCESS DOORS

.1 Supply access doors for concealed electrical equipment to allow operation, inspection, adjusting and servicing.

.2 Use flush mounted 600 x 600 mm for body entry and 300 x 300 mm for hand entry unless otherwise noted. Doors to open 180, have rounded safety corners, concealed hinges, screwdriver latches and anchor straps.

.3 Material:

- .1 Use stainless steel with brushed satin or polished finish in special areas such as tiled or marble surfaces and as directed by Owner.
- .2 In remaining areas, use prime coated steel.
- .3 Use ULC rated access doors in fire rated walls and ceilings.

.4 Installation

- .1 Locate so that concealed items are accessible.
- .2 Locate so that hand or body entry (as applicable) is achieved.
- .3 Installation is specified in applicable sections.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

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

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

.3 Factory assemble control panels and component assemblies.

2.2 FINISHES

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

.1 Paint outdoor electrical equipment "equipment green" finish to EEMAC Y1-1.

2.3 WIRING TERMINATIONS

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

2.4 WIRING IDENTIFICATION

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

.2 Maintain phase sequence and colour coding throughout.

.3 Colour code: to Ontario Electrical Safety Code

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

2.5 EXAMINATION OF OTHER WORK

.1 This Division requires the examination of the material and work for all other Divisions under which the work of this Section depends for proper completion. Any defect in work, levels or materials shall be reported to the Owner. The work of this Division shall not commence until such defects have been corrected. This also applied to existing work installed under other Contracts.

2.6 CUTTING, PATCHING, SLEEVES AND PLATES

.1 All drilling for hangers, rod, inserts and work of similar nature shall be done by Division 26.

.2 Have core drilled openings installed in foundation walls to accommodate the work of this Division. Seal conduit or cable through the cored opening using industrial duty round compression seals sized to suit diameter of conduit or cable. Cable seals to be Roxtec RS type or approved equal.

2.7 TESTING, ACCEPTANCE AND GUARANTEE

.1 The work of this Contract shall be tested and installed and any defects in operation shall be remedied immediately. Tests required by local authorities shall be the responsibility of the Contractor. When the work is completed, it shall be tested in its entirety and shall be in good working order before the Owner's Certificate of Acceptance shall be issued.

PART 3 EXECUTION

3.1 CO-ORDINATION OF PROTECTIVE DEVICES

.1 Ensure circuit protective devices such as circuit breakers are installed to required values and settings.

3.2 FIELD QUALITY CONTROL

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

.2 The work of this division to be carried out by a contractor who holds a valid Electrical Contractor License as issued by the ESA.

.3 Insulation resistance testing.

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

.2 Measure and record 350 – 600 V circuits, feeders and equipment with a 1000 V instrument.

.3 Check resistance to ground before energizing and record value.

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

3.3 PREPERATION FOR FIRESTOPPING

.1 Prepare the space between conduits and adjacent sleeve or fire separation for the use of fire proofing material.

.2 Where cables or conduits pass through fire rated walls or ceilings, sleeve with steel conduit and prepare the opening for fire and smoke sealing and seal with proper fire and smoke rated material.

.3 Where conduits pass through fire or smoke rated partitions, install a junction box in the conduit just prior to exiting the space. Use this junction box to install smoke stopping material.

3.4 PAINTING

.1 Apply at least one coat of corrosion resistant primer paint to ferrous supports and site fabricated work.

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

.3 Restore to new condition, finishes that have been damaged too extensively to be primed and touched up.

3.5 DRAWINGS, CHANGES, ACCESSIBILITY

.1 The drawings shall be considered to show the general character and scope of work and not the exact details of the installation.

.2 The installation shall be complete with all supports and accessories required for a complete operative and satisfactory installation.

.3 The location, arrangement and connection of equipment and materials as shown on the drawings represent a close approximation to the intent and requirements of the Contract.

.4 The right is reserved by the Owner to make reasonable changes required to accommodate conditions arising during the progress of the work. Such changes shall be done at no extra cost to the Owner unless the location, arrangement or connection is more than 3.0 m from that shown.

.5 Actual location of existing services shall be verified in the field where necessary before work is commenced.

.6 Changes and modifications necessary to ensure co-ordination and to avoid interference or conflicts with other trades, or to accommodate existing conditions, shall be made at no extra cost to the Owner.

3.6 CLEANING

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

.2 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.

.3 Complete final cleaning of equipment and work area as acceptable to Owner.

.4 At time of final cleaning, clean lighting, reflectors, lenses and other lighting surfaces that have been exposed to construction dust and dirt.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Materials and installation for wire and box connectors.

1.2 RELATED SECTIONS

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

1.3 REFERENCES

.1 Canadian Standards Association (CSA)

.1 CAN/CSA-C22.2 No.18, Outlet Boxes, Conduit Boxes and Fittings.

.2 CAN/CSA-C22.2 No.65, Wire Connectors (Tri-National Standard with UL 486A-486B and NMX-J-543-ANCE-03).

.2 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)

.1 EEMAC 1Y-2, Bushing Stud Connectors and Aluminum Adapters (1200 Ampere Maximum Rating).

.3 National Electrical Manufacturers Association (NEMA)

PART 2 PRODUCTS

2.1 MATERIALS

.1 Pressure type wire connectors to: CSA C22.2 No.65, with current carrying parts of copper sized to fit copper conductors as required.

.2 Fixture type splicing connectors to: CSA C22.2 No.65, with current carrying parts of copper sized to fit copper conductors 10 AWG or less.

.3 Bushing stud connectors: to EEMAC 1Y-2 to consist of:

.1 Connector body and stud clamp for stranded copper conductors.

.2 Clamp for copper bar.

.3 Stud clamp bolts.

.4 Bolts for copper bar.

.5 Sized for conductors and bars as indicated.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Remove insulation carefully from ends of conductors and:

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

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

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

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 26 05 20 - Wire and Box Connectors - 0 - 1000 V.

.2 Section 26 05 34- Conduits, Fastenings and Fittings.

.3 Refer to drawings for wiring type required under different applications.

PART 2 PRODUCTS

2.1 BUILDING WIRES

.1 Conductors: stranded for 8 AWG and larger. Minimum size: 12 AWG.

.2 Copper conductors: size as indicated, with 600 V insulation of cross-linked thermosetting polyethylene material rated RW90 XLPE and RWU90 XLPE as indicated.

.1 Use RW90 XLPE or RWU90 XLPE in underground conduits.

.3 Copper conductors: size as indicated, with thermoplastic insulation type TWH rated at 600 V, typically used for insulated bond wires.

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Perform tests using method appropriate to site conditions and to approval of Owner and local authority having jurisdiction over installation.

.3 Perform tests before energizing electrical system.

.4 No splices permitted in panel board feeders in new construction. Splices in re-work or renovation projects only with pre-approval by Owner.

3.2 GENERAL CABLE INSTALLATION

.1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 V).

.2 Cable Colour Coding: to Section 26 05 00 Common Work Results for Electrical.

3.3 INSTALLATION OF BUILDING WIRES

.1 Install wiring as follows:

.1 In conduit systems in accordance with Section 26 05 34- Conduits, Fastenings and Fittings.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

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

.2 Grounding conductors for all distribution grounding to be insulated copper, uninsulated where in contact with earth. Copper conductors shall, at a minimum, be used in the following areas: grounding of incoming electrical services.

1.2 REFERENCES

.1 Ontario Electrical Safety Code (OESC) – Latest Edition

PART 2 PRODUCTS

2.1 EQUIPMENT

.1 Plate electrodes: copper, surface area 0.2 m^2, 1.6 mm thick.

.2 Grounding conductors: bare stranded copper, soft annealed, minimum size #6 AWG.

.3 Insulated bonding conductors: green, type TW. Size per OESC Table 16.

PART 3 EXECUTION

3.1 INSTALLATION GENERAL

.1 Install complete permanent, continuous grounding and bonding system including, electrodes, conductors, connectors, accessories. Where EMT is used, run insulated copper ground wire in conduit.

.2 Install connectors in accordance with manufacturer's instructions.

.3 Protect exposed grounding conductors from mechanical injury.

.4 Make buried connections, and connections to conductive electrodes using copper welding by thermit process or with approved connectors.

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

.6 Soldered joints not permitted.

.7 Ground secondary service pedestals.

3.2 ELECTRODES

.1 Install plate electrodes and make grounding connections.

.2 Use size #6 AWG copper conductors for connections to electrodes as required by code.

3.3 EQUIPMENT BONDING

.1 Install Bonding connections to typical equipment included in, but not necessarily limited to following list: Distribution panels, outdoor illuminated signs.

END OF SECTION

PART 1 PRODUCTS

1.1 CONDUITS

.1 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings.

.2 Rigid PVC conduit: to CSA C22.2 No. 211.2.

1.2 CONDUIT FASTENINGS

.1 One hole steel straps to secure surface conduits 50 mm and smaller. Two hole steel straps for conduits larger than 50 mm.

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

.3 Channel type supports for two or more conduits at 1.5 m oc.

.4 Threaded rods, 6 mm dia., to support suspended channels.

1.3 CONDUIT FITTINGS

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

.2 Factory "ells" where 90º, 45 º or 22.5 º bends are required for 25 mm and larger conduits.

.3 Ensure conduit bends other than factory “ells” are made with an approved bender. Making offsets and other bends by cutting and rejoining 90 degree bends are not permitted.

.4 Connectors and couplings for EMT. Steel set-screw type, size as required.

1.4 EXPANSION FITTINGS FOR RIGID CONDUIT

.1 Weatherproof expansion fittings with internal bonding assembly suitable for 100 mm linear expansion.

.2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection in all directions.

.3 Weatherproof expansion fittings for linear expansion at entry to panel.

1.5 FISH CORD

.1 Polypropylene.

PART 2 EXECUTION

2.1 MANUFACTURER'S INSTRUCTIONS

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

2.2 INSTALLATION

.1 Install all conduit, conduit fittings and accessories in accordance with the latest edition of the Ontario Electrical Safety Code in a manner that does not alter, change or violate any part of the installed system components or the CSA/UL certification of these components.

.2 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.

.3 Conceal conduits except in mechanical and electrical service rooms and in unfinished areas.

.4 Surface mount conduits except in finished areas or as indicated.

.5 Use electrical metallic tubing (EMT) except in cast concrete, as well as concealed work in masonry construction.

.6 Use rigid PVC conduit underground and buried in or under concrete slab on grade.

.7 Install fish cord in empty conduits.

.8 Dry conduits out before installing wire.

2.3 SURFACE CONDUITS

.1 Run parallel or perpendicular to building lines.

.2 Locate conduits behind infrared or gas fired heaters with 1.5 m clearance.

.3 Run conduits in flanged portion of structural steel.

.4 Group conduits wherever possible on suspended channels.

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

.6 Do not locate conduits less than 75 mm parallel to steam or hot water lines with minimum of 25 mm at crossovers.

2.4 CONCEALED CONDUITS

.1 Run parallel or perpendicular to building lines.

.2 Do not install horizontal runs in masonry walls.

.3 Do not install conduits in terrazzo or concrete toppings.

2.5 CONDUITS IN CAST-IN-PLACE CONCRETE

.1 Locate to suit reinforcing steel. Install in centre one third of slab. Use rigid PVC conduit.

.2 Install sleeves where conduits pass through slab or wall.

.3 Provide oversized sleeve for conduits passing through waterproof membrane, before membrane is installed. Use cold mastic between sleeve and conduit.

.4 Encase conduits completely in concrete with minimum 25 mm concrete cover.

.5 Organize conduits in slab to minimize cross-overs.

2.6 CONDUITS UNDERGROUND

.1 Slope conduits to provide drainage.

.2 Waterproof joints (PVC excepted) with heavy coat of bituminous paint.

2.7 CLEANING

.1 On Completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools, and equipment.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Materials and installation for standard and custom breaker type panelboards.

1.2 RELATED SECTIONS

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

1.3 REFERENCES

.1 Canadian Standards Association (CSA)

.1 CSA C22.2 No.29, Panelboards and enclosed Panelboards.

1.4 SUBMITTALS

.1 Drawings to include electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.

PART 2 PRODUCTS

2.1 PANELBOARDS

.1 Panelboards: to CSA C22.2 No.29 and product of one manufacturer.

.1 Install circuit breakers in panelboards before shipment.

.2 In addition to CSA requirements manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.

.2 250 and 600 V panelboards: bus and breakers rated for 10,000 and 18,000 A (symmetrical) minimum interrupting capacity respectively or as indicated on electrical drawings.

.3 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.

.4 Panelboards: mains, number of circuits, and number and size of branch circuit breakers as indicated.

.5 Two keys for each panelboard and key panelboards alike.

.6 Tin plated aluminum bus with neutral of same ampere rating as mains.

.7 Mains: suitable for bolt-on breakers.

.8 Trim with concealed front bolts and hinges.

.9 Trim and door finish: baked grey enamel.

2.2 BREAKERS

.1 Breakers with thermal and magnetic tripping in panelboards except as indicated otherwise.

.2 Main breaker: separately mounted on top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker.

2.3 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Section 26 05 00 – Common Work Results - Electrical.

.2 Nameplate for each panelboard size 4 engraved as indicated.

.3 Nameplate for each circuit in distribution panelboards size 2 engraved as indicated.

.4 Complete circuit directory with typewritten legend showing location and load of each circuit.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.

.2 Install surface mounted panelboards on plywood backboards. Where practical, group panelboards on common backboard.

.3 Mount panelboards to height specified in Section 26 05 00 – Common Work Results - Electrical or as indicated.

.4 Connect loads to circuits.

.5 Connect neutral conductors to common neutral bus with respective neutral identified.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL

.1 This section describes the extent of services to be provided for wiring of equipment supplied by others.

.2 Within the context of this section, Others means:

.1 Other divisions of this specification.

.2 The Owner, as defined in the Contract.

.3 Other contractors supplying and installing equipment to the contract.

1.2 EXTENT OF SERVICES PROVIDED

.1 The work of this contract is to include all power wiring of equipment which is provided by Division 26.

.2 All power and control wiring above 50 V for equipment supplied by others will be the responsibility of this contractor.

.3 Final connection of all wiring to equipment provided by others (except control wiring below 50 V associated with Division 25 equipment) will be by division 26. Coordinate with the provider for connection instructions.

1.3 RESPONSIBILITY OF DIVISION 26

.1 It is the responsibility of the Division 26 subcontractor to verify final requirements for wiring of all equipment noted. Verification of wiring requirements to include:

.1 Confirmation of electrical characteristics.

.2 Location of connection point.

.3 Method of connection (i.e. direct or plug-in etc.)

.2 Obtain and become familiar with shop drawings for all relevant equipment.

.3 No claim for extra will be entertained for wiring equipment which has been indicated, or changes to installed wiring where installation proceeded prior to verification of electrical requirements.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION