PROJECT MANUAL

The City of Winnipeg
Bid Opportunity No. 836-2012
Roof Replacement for the Carnegie Building at 380 William Ave. Winnipeg, MB

ALA Project Number: 1210

Consultants

AGER LITTLE ARCHITECTS INC

Crosier Kilgour and Partners Ltd.

Epp Siepman Engineering

November 9, 2012

Set Number _____

Section No./Title

REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL SPECIFICATIONS

THIS TENDER/CONTRACT PACKAGE INCLUDES THE FOLLOWING DRAWINGS:

~ END ~

1.1 General

.1 Comply with requirements of the Manitoba Building Code - Latest Edition, Part 8 "Construction Safety".

.2 Protect existing Work from damage. Seal off areas not included in renovations with dust proof hoardings.

.3 Make good all damage to existing construction.

.4 Except for items specifically noted, waste or abandoned materials and equipment are Contractor's property and must be promptly removed from the Site.

.5 Removal Work including limits and scheduling of same must only be undertaken with Contract Administrator's approval.

.6 Salvage material may be re-used in new construction when and where approved by Contract Administrator and the City.

.7 Where security has been reduced by Work of Contract, provide temporary means to maintain security to the space.

.8 Maintain vacuum cleaner(s) with good suctioning capabilities on Site. Minimize dust migration into occupied areas by vacuuming Work areas(s) as required.

.9 Use only sparkproof tools and explosion proof equipment where explosive fumes may exist.

1.2 Codes and Standards

.1 Execute Work in accordance with the Manitoba Building Code (MBC) and supplements; the editions current at time of bid closing.

.2 Wherever codes, standards, regulations are referenced herein they shall mean the latest editions including amendments, supplements and revisions as of the date of bid closing.
In no instance shall the standard of quality of materials, products and Workmanship established by these specifications and drawings be reduced by any of the codes, standards, or regulations.

1.3 Building Envelope

.1 Seal around openings, protrusions, or penetrations through building envelope to maintain integrity of air and vapour barriers/assemblies. Patch and repair tears, punctures or other damage to building envelope with suitable materials to standard of new construction.

1.4 Site Examination

.1 Before starting actual construction Work, check field conditions, obtain, and confirm actual Site dimensions, examine conditions, etc., as required to ensure correct execution of Work. Notify the Contract Administrator in writing of all matters that could prejudice proper execution of the Work.

.2 Start of construction or any part thereof constitutes acceptance of existing conditions and means dimensions have been considered, verified and are acceptable.

1.5 Existing Mechanical and Electrical Services

.1 Prior to start of Work identify and confirm the location of mechanical and electrical services within or passing through construction areas. Confirm their origin and destination.

.2 Where services are concealed within walls, floors, or ceilings and cannot be visually identified use electronic scanning devices or other acceptable means to locate and identify concealed services.

.3 Include required connections, temporary or permanent, for continuance of existing services. Overtime, if necessary to make such connections, shall also be included in this Contract. Scheduling as directed by the Contract Administrator and/or the the City.

.4 Where Work involves breaking into or connecting to existing services, carry out Work at times directed by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.

.5 Before commencing Work, establish location and extend service lines in area of Work and notify Contract Administrator and/or the City of findings.

.6 Where unknown services are encountered, immediately advise Contract Administrator and confirm findings in writing.

.7 Remove abandoned service lines. Cap or otherwise seal lines at cut-off points as directed by the Contract Administrator and/or the the City.

.8 Record locations of maintained, re-routed abandoned service lines on record as-built drawings.

1.6 Layout of the Work

.1 Assume full responsibility for and execute compete layout of Work to locations, lines and elevations indicated.

.2 Layout Work to designated reference points.

.3 Provide such devices as straight edges and templates required for Contract Administrator's inspection of the Work.

1.7 Planning of Work

.1 Adjacent areas may be occupied by the the City during term of this contract for fit up purposes.

.2 Obtain The City's approval of scheduling of renovation Work within or immediately adjacent to occupied areas. Periods for shutting off mechanical and electrical services must be acceptable to The City.

1.8 Definition of Trades

.1 For convenience of reference only, the specifications are separated into titled Sections. Sections are identified by title and a six-digit number system.

.2 Contractor shall be totally responsible as to which Subcontractor provides required materials or articles and Work.

1.9 Record Drawings

.1 Contract Administrator will provide three (3) sets of white prints for recording deviations from Contract Documents and establishing the "as built" condition of the project.

.2 Maintain Record Drawings by accurately indicating "as built" changes in red. Update weekly.

.3 Bring one set of Record Drawings to all project coordination meetings.

.4 Refer to Contract Administrator specifications for specifics of Record Drawings for Mechanical and Electrical Work.

.5 Record following information:

.1 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.

.2 Field changes of dimension and detail.

.3 Changes made by Change Order, and Change Directive.

.4 Supplemental information made by Supplemental Instruction.

.5 Site measurements of existing conditions.

.6 Every Record Drawings submitted shall include the following information:

.1 Current date.

.2 Name of company which recorded the information.

.3 Name(s) and signatures(s) of individuals who recorded the information.

.7 Submit two identical sets of Record Drawings to Contract Administrator, just prior to application for Substantial Performance of the Work.

.8 Continue to record changes occurring after Substantial Performance of the Work on separate set of "white" prints (provided by Contract Administrator) marked POST SUBSTANTIAL PERFORMANCE RECORD DRAWINGS and submit the final two sets of Record Drawings showing final changes as soon as Work is complete.

~ END ~

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises removal and replacement of the roof structure and roofing system of the Carnegie Building, located at 380 William Avenue in Winnipeg.

1.2 CONTRACT METHOD

.1 Construct Work under the conditions of the City of Winnipeg Bid Opportunity.

1.3 REFERENCES AND CODES

.1 Perform Work in accordance with the National Building Code of Canada (NBC) including all amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of contract documents, specifications, as specified standards, codes and referenced documents, latest editions.

.3 Unless specified otherwise, Contractor shall at his own expense obtain all required permits and certificates of inspection and approval from proper authorities. These shall be turned over to the Contract Administrator prior to Certificate of Substantial Performance being issued.

1.4 WORK SEQUENCE

.1 City of Winnipeg will continue to use the building throughout the construction process. Construct Work in stages to accommodate City of Winnipeg's continued use of premises during construction.

.2 Co-ordinate Progress Schedule and co-ordinate with City of Winnipeg Occupancy during construction.

.3 Construct Work in stages to provide for continuous public and staff usage. Do not close off public usage of facilities at any time during construction.

1.5 CONTRACTOR USE OF PREMISES

.1 Limit use of premises for Work, for storage, and for access, to allow:

- .1 City of Winnipeg occupancy.
- .2 Public usage.
- .3 Continuous access to the building entrances/exits.
- .4 Continuous use of adjacent parking area (west side of building) unless otherwise agreed to by City of Winnipeg.

.2 Co-ordinate use of premises under direction of Contract Administrator.

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

.4 Remove or alter existing Work to prevent injury or damage to portions of existing Work which remain.

.5 Repair or replace portions of existing Work which have been altered during construction operations to match existing or adjoining Work, as directed by Contract Administrator.

.6 At completion of operations condition of existing Work: equal to or better than that which existed before new Work started.

1.6 CITY OCCUPANCY

.1 City of Winnipeg will occupy premises during entire construction period for execution of normal operations.

.2 Co-operate with City of Winnipeg in scheduling operations to minimize conflict and to facilitate City of Winnipeg usage.

1.7 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute Work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with Contract Administrator to facilitate execution of Work.

1.8 EXISTING SERVICES

.1 Notify City of Winnipeg and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves connecting to existing services, give City of Winnipeg minimum 48 hours notice for necessary interruption of mechanical or electrical service throughout course of Work. Minimize duration of interruptions.

.3 Where unforeseen services or utilities are encountered, immediately advise Contract Administrator and confirm findings in writing.

.4 Protect, relocate or maintain existing active services.

1.9 DOCUMENTS REQUIRED

.1 Maintain at job Site, one copy each document as follows:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Reviewed Shop Drawings.
- .5 Change Orders.
- .6 Other Modifications to Contract.
- .7 Field Test Reports.

.8 Copy of Approved Work Schedule.

.9 Health and Safety Plan and Other Safety Related Documents including:

.1 Material data sheets (MSDS) on all products used in Project.

.10 Record or "as built" drawings.

.11 Other documents as specified.

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 11 00 – Summary of Work.

1.2 ACCESS AND EGRESS

.1 Design, construct and maintain temporary "access to" and "egress from" Work areas, in accordance with relevant municipal, provincial and other regulations.

1.3 USE OF SITE AND FACILITIES

.1 Contractor shall gain access to the roof from the exterior of the building only. If access is required from the interior, the Contract Administrator shall be contacted so that necessary arrangements can be made.

.2 Execute Work with least possible interference or disturbance to normal use of premises. Make arrangements with Contract Administrator to facilitate Work as stated.

.3 Maintain existing services to building and provide for personnel and vehicle access.

.4 Where security is reduced by Work provide temporary means to maintain security.

.5 Ensure that Contractor personnel employed on Site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.6 Keep within limits of Work and avenues of ingress and egress.

1.4 WORKING HOURS

.1 Working hours for demolition or other Work processes deemed to be excessively noisy [or disruptive will be restricted to between 4:00 p.m. and 11:00 p.m. Monday through Friday, and unrestricted on Saturday.

.2 Working hours for all other Work processes will be restricted to between 7:00 a.m. and 11:00 p.m. Monday through Friday, and unrestricted on Saturday.

.3 If Working outside of the hours of 8:30 a.m. to 4:30 p.m. Monday to Friday this Work is to be coordinated with the Contract Administrator.

.4 Notwithstanding the above, all Work shall be completed in conformance with City of Winnipeg Neighbourhood Liveability By-Law No. 1/2008.

1.5 SPECIAL REQUIREMENTS

.1 All Work which interferes with the normal operation of the facility will have to be precisely coordinated with City of Winnipeg.

.2 Ensure that Contractor personnel employed on Site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.3 Keep within limits of Work and avenues of ingress and egress.

1.6 BUILDING SMOKING ENVIRONMENT

.1 Smoking is not allowed.

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 03 30 00 – Cast-in-Place Concrete.

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

.3 Section 07 55 00 – SBS Roofing System.

1.2 CASH ALLOWANCES FOR TESTING, EXAMINATION

.1 Include in Contract Price, allowances to cover costs of Site and laboratory testing and examination listed.

.2 Tests and testing requirements as specified shall be carried out by independent examining, testing companies, as appointed by the Contractor and acceptable to the Contract Administrator.

.3 Obtain quotations from examining and testing companies and submit to Contract Administrator for review.

.4 Pay all costs for specified examination, testing Work performed by independent examining and testing companies, from cash allowance specified.

.5 The invoices for Work performed by the specialist examining and testing companies shall be directed to the Contractor, and forwarded with monthly request for payment.

.6 Cash Allowance is for payment of examining, testing company invoices only. Contractor costs for Site supervision and coordination is deemed to be part of overhead included in the Bid.

.7 Specific testing requirements are outlined in respective technical Sections. Materials failing to meet specified requirements shall be replaced or repaired and retested as directed by Contract Administrator, with all costs involved in retesting borne by the Contractor.

.8 Include testing/examination allowances for:

.1 Concrete and mortar testing cash allowance: lump sum of $1,200.00.

.2 Roofing testing cash allowance: lump sum of $7,500.00.

1.3 CASH ALLOWANCES FOR LABOUR AND MATERIALS

.1 Include in Contract Price, allowances to cover costs of labour and materials identified.

.2 Obtain quotations from qualified trades and submit to Contract Administrator for review.

.3 Pay all costs for specified labour and material Work performed by trade, from cash allowance specified.

.4 The invoices for Work performed by the selected trade shall be directed to the Contractor, and forwarded with monthly request for payment.

.5 Cash Allowance is for payment of subtrade invoices only. Contractor costs for Site supervision and coordination is deemed to be part of overhead included in the Bid.

.6 Include materials and labour allowances for:

.1 Interior plaster/painting repairs: lump sum of $10,000.00

1.4 ADJUSTMENTS OF CASH ALLOWANCES

.1 Contractor shall not exceed Cash Allowances without authority from Contract Administrator. Contractor will not be allowed expenses or profit on overage unless authority for over expenditure is obtained. Over expenditure of Cash Allowances may, at Contract Administrator's discretion, be deducted from sums of money due Contractor, should Contractor exceed allowance without authority from the Contract Administrator.

.2 Adjustments to the Cash Allowances will be made by a written Change Order, signed by the City of Winnipeg, or as amendments to the Contract at the time of final payment, on the basis of submitted net cost invoices.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

1.1 Related Documents

.1 The Builders' Liens Act (Manitoba), latest edition and amendments.
.2 The City of Winnipeg General Conditions of the Construction Contract, latest edition.
.3 The City of Winnipeg General Conditions for Construction, latest edition.

1.2 Schedule of Values

.1 Submit to the Contract Administrator, Schedule of Values, at least ten days prior to submitting first Application for Payment.
.2 Use Schedule of Values as basis for Contractor's Progress Claim.
.3 Form of submittal:
  .1 Submit typewritten Schedule of Values on 8½" x 11" white paper.
  .2 Use Table of Contents of this Project Manual as basis for format for listing costs of Work for Sections.
  .3 Identify each line item with number and title as listed in Table of Contents of this Project Manual.
.4 Itemize separate line item cost for Work required by each Section of this Project Manual.
.5 After review by Contract Administrator, revise and resubmit Schedule as directed.

~ END ~

Part 1 General

1.1 PRECONSTRUCTION MEETING

.1 Within 10 Working days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Senior representatives of City of Winnipeg, Contract Administrator, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include:

- .1 Appointment of official representative of participants in the Work.
- .2 Schedule of Work: in accordance with Section 01 32 16 - Construction Progress Schedule.
- .3 Submission of shop drawings, concrete mix designs, samples. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Requirements for temporary facilities, Site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
- .5 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
- .6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
- .7 Delivery schedule of specified materials.
- .8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .9 Monthly progress claims, administrative procedures, photographs, hold backs.
- .10 Appointment of inspection and testing agencies or firms.
- .11 Insurances, transcript of policies.

1.2 PROGRESS MEETINGS

.1 During course of Work schedule progress meetings at biweekly intervals.

.2 Contractor, major Subcontractors involved in Work, Contract Administrator and City of Winnipeg's representative are to be in attendance.

.3 Contract Administrator will be responsible for recording minutes of meetings and circulate to attending parties and affected parties not in attendance within 5 Working days after meeting.

.4 Agenda to include the following:

- .1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.
.3 Field observations, problems, conflicts.
.4 Problems which impede construction schedule.
.5 Review of off-Site fabrication delivery schedules.
.6 Corrective measures and procedures to regain projected schedule.
.7 Revision to construction schedule.
.8 Progress schedule, during succeeding Work period.
.9 Review submittal schedules: expedite as required.
.10 Maintenance of quality standards.
.11 Review proposed changes for affect on construction schedule and on completion date.
.12 Other business.

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 REQUIREMENTS

.1 Ensure Schedule is practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

1.2 SUBMITTALS

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

.2 Submit to Contract Administrator within 10 Working days of Award of Contract Bar (GANTT) Chart for planning, monitoring and reporting of project progress.

1.3 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Contract Administrator will review and return revised schedules within 5 Working days.

.3 Revise impractical schedule and resubmit within 5 Working days.

.4 Accepted revised schedule will be used as baseline for updates.

1.4 PROJECT SCHEDULE

.1 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.
.2 Mobilization.
.3 Installation of Site hoarding and protection.
.4 Demolition Work.
.5 Fabrication and delivery of structural framing members and roof deck.
.6 Roofing and drain installation.
.7 Mechanical and electrical Work.
.8 Construction of attic space partitions.

1.5 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on biweekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.6 PROJECT MEETINGS

.1 Discuss Project Schedule at regular Site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

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 32 16 – Construction Progress Schedule.

.2 Section 01 35 24 – Health & Safety Requirements.

.3 Section 01 52 00 – Construction Facilities.

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

.5 Section 03 20 00 – Concrete Reinforcing.

.6 Section 03 30 00 – Cast-in-Place Concrete.

.7 Section 05 12 23 – Structural Steel.

.8 Section 05 21 00 – Steel Joists.

.9 Section 05 31 00 – Steel Decking.

.10 Section 05 41 00 – Steel Studs.

1.2 ADMINISTRATIVE

.1 Submit to Contract Administrator submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Review submittals prior to submission to Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.4 Notify Contract Administrator, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.5 Verify field measurements and affected adjacent Work are co-ordinated.

.6 Contractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator's review of submittals.

.7 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator review.

.8 Keep one reviewed copy of each submission on Site.

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in Province of Manitoba, Canada.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Allow 5 working days for Contract Administrator's review of each submission.

.5 Adjustments made on shop drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.

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

.7 After Contract Administrator's review, distribute copies.

.8 Submit electronic copy in PDF format of shop drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.

.9 Submit electronic copy in PDF format of product data sheets or brochures for requirements requested in specification Sections and as requested by Contract Administrator where shop drawings will not be prepared due to standardized manufacture of product.

.10 Delete information not applicable to project.

.11 Supplement standard information to provide details applicable to project.

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

1.4 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to Contract Administrator's business address.

.3 Notify Contract Administrator in writing, at time of submission of deviations in samples from requirements of Contract Documents.

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

.5 Adjustments made on samples by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing prior to proceeding with Work.

.6 Make changes in samples which Contract Administrator may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 MOCK-UPS

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

1.6 CERTIFICATES AND TRANSCRIPTS

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

.2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

1.1 Safety Codes and Standards

.1 Observe and enforce construction safety measures required by Canadian Construction Safety Code, Manitoba Building Code, Provincial Government, Workers Compensation Board, municipal statutes, and authorities having jurisdiction.

.2 Use hard hat, safety shoes, respirators, eye/ear protection required on Site. Provide evidence of WHMIS training, Workers Compensation Status and coverage.

.3 In event of conflict between any provisions of above authorities, the most stringent provision will apply.

1.2 Security Requirements

.1 Make provision for and provide security system covering the entire construction Site and Works meeting the requirements of the following guidelines and as may be acceptable to the City of Winnipeg.

.2 Provide supervision of entire construction Site and Work, maintained continually during Working hours.

.3 Maintain cell phone contact capability for immediate response to calls from the City of Winnipeg.

.4 Maintain total inaccessibility, to entire construction Site and Works, of all members of the public and unauthorized staff, except under the express control of the Contractor and then only during daylight hours.

.5 Provide and maintain sufficient fire fighting equipment and apparatus to ensure the fire safety of the building, its staff and the public within and in proximity of the construction Site.

.6 Contractor to retain at the Site, at all times, the names and telephone numbers of all Contractors and Subcontractors representatives, available at hand for use in the event of a need for immediate response in an emergency situation. The evaluation of a need is the responsibility of the City.

.7 Contractor to instruct own security forces that, if an emergency arises and the City of Winnipeg deem it necessary, the Contractors forces are to respond and assist in the action required to deal with emergency.

1.3 Phone Numbers for City's Use in Case of Emergency

.1 Submit a complete list of business, cellular, and home telephone numbers of Site foreman and project manager (or City of Winnipeg) for Contractor and all Sub-Contractors. Prior to starting Work on project, send list to City's Project Manager.

.2 Immediately after any change occurs, update list and resubmit as above.

1.4 Construction Keys for City of Winnipeg Use

.1 For fire safety and emergencies, the City of Winnipeg requires construction keys and combination lock codes for immediate access to construction areas at all times. Cooperate with City of Winnipeg in this regard.

1.5 Fire Safety Requirements

.1 Ensure that all employees and those of subcontractors adhere to all City of Winnipeg's Fire Safety Precautions listed below. Fire prevention measure and procedure acceptable to the City of Winnipeg shall be maintained on the construction Site and on the property at all times.

.2 Should a "false" fire alarm or a fire result from any action on part of the Contractor, Subcontractor or other employees, the Contractor shall immediately report to the City of

Winnipeg. If requested by Project Manager, Contractor shall complete necessary documentation and attend necessary meetings pertaining to the incident.

.3 Supply and maintain in Working the necessary fire safety equipment on the construction Site, such as: extinguishers, fire prevention equipment, fire fighting equipment, required by codes, authorities and municipal statues, or if requested by Contract Administrator or City of Winnipeg. Make regular inspections to ensure fire safety equipment is at its designated locations, in Working order. Do not remove extinguishers which are the property of the City of Winnipeg from their designated locations, except for extinguishing a fire. If an City of Winnipeg's extinguisher is used for any reason, immediately notify both the Project Manager by telephone and in writing, to ensure that extinguisher is replaced and/or recharged.

.4 Cutting, Grinding and Welding:

1. Provide one assistant for each employee cutting, grinding or welding metal. Assistant shall be armed with a fire extinguisher (ABC Multipurpose Class, minimum 10 lbs. Capacity) and shall have no other duties other than to watch for and extinguish parks and to enforce Fire Safety Precautions listed below, while partner is cutting, grinding or welding metal. Assistant shall have a thorough knowledge of Fire Safety Precautions and shall be trained in fire extinguishing. Protect building and contents against heat, sparks and fire, by fire resistant blankets, shields or welding screens.
2. While brazing or soldering, protect building and contents against heat, sparks or fire by shielding. Maintain a fire extinguisher (ABC Multipurpose Class, minimum 10 lbs. Capacity) in Working order, at each Work station, within close reach of all personnel located at that station, including stations where lead or lead joints are heated and where materials are heated with torches or open flames.
3. Provide and maintain in Working order fire extinguishers (ABC Multipurpose Class, minimum 10 lbs. capacity), fire resistant blankets and shields, and welding screens on all welding carts.
4. Prior to performing brazing, soldering, grinding, cutting, welding, lead caulking, sanding, painting or any operations which create dust, fumes, vapours or smoke, check Work area for smoke detection equipment. Initiate a request to replace smoke detectors with thermal detectors in areas where Work may trigger smoke detectors. Immediately after Work in the affected area(s) has been completed, initiate a request to replace the smoke detectors, which were initially removed. Seal off each Work area with dust proof hoarding to produce an air-lock, to ensure smoke detectors in other areas will not be triggered. Provide necessary ventilation to outdoors to maintain Work area under negative pressure, in order to contain the dust, fumes, vapours or smoke from Work and limit their density such that smoke detectors in building will not be activated.

1.6 WORKPLACE HAZARDOUS MATERIAL INFORMATION SYSTEM (W.H.M.I.S.)

.1 The Contractor is responsible for securing Material Safety Data Sheets relating to specified products or other regulated products and materials that will be used on the Work Site, including those materials not specified herein.

.2 The Contractor at Award of Tender will maintain copies of all pertinent safety data sheets.

.3 The Contractor is responsible for making available to his employees and subcontractors, hazard information and warnings related to products specified herein as well as other products not specified but may be used.

.4 The Contractor shall take all precautions as may be required or reasonable in this circumstance to protect his employees, public, and the employees of the City of Winnipeg during the handling, storage and applications of these products.

.5 The Contractor will be held responsible for any damage, costs or losses to the City of Winnipeg's property, its employees, and facilities by his failure to take the necessary precautions during the handling, storage and applications of all products used for carrying out the Work.

.6 Storage of hazardous materials within or around the facility will not be allowed.

~ END ~

Part 1 General

1.1 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 Manitoba

.1 The Workers Compensation Act RSM 1987 - Updated 2006.

.2 Manitoba Regulation 217/2006 – Workplace Safety and Health Regulation.

1.2 SUBMITTALS

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

.2 Submit copies of incident and accident reports.

.3 Submit WHMIS MSDS - Material Safety Data Sheets on all products used in conjunction with the Work.

.4 W.H.I.M.I.S. Training: Provide copies of valid certification/training for all employees (regular or temporary) including all subcontractors.

.1 All individuals involved in the application of any product shall meet all WHIMIS/provincial standards safety/protection requirements at all times.

.5 Upon request submit Letter of Good Standing or C.O.R. Certificate.

1.3 GENERAL REQUIREMENTS

.1 Develop written Site-specific Health and Safety Plan based on hazard assessment prior to beginning Site Work and continue to implement, maintain, and enforce plan until final demobilization from Site. Health and Safety Plan must address project specifications.

1.4 RESPONSIBILITY

.1 Be responsible for health and safety of persons on Site, safety of property on Site and for protection of persons adjacent to Site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with Site-specific Health and Safety Plan.

1.5 PERSONAL PROTECTIVE EQUIPMENT (PPE)

.1 All employees (regular or temporary) of contractor and subcontractors shall wear PPE in accordance with Manitoba Regulation 217/2006.

.2 Fall Protection: Provide fall protection in accordance with Manitoba Regulation 217/2006.

1.6 WORK STOPPAGE

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

1.1 Fires

.1 Fires and burning rubbish on City of Winnipeg's property is not permitted.

1.2 Waste Disposal

.1 Remove waste, debris, and excess materials from the City of Winnipeg property at completion of project. Remove waste at regular intervals during the course of construction. Do not allow build up of waste outside approved waste containers at any time.

.2 Do not bury rubbish and waste materials on City of Winnipeg's property.

.3 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

.4 Legally dispose of all waste materials.

.5 Do not use City of Winnipeg's existing waste disposal containers.

.6 General construction waste is to be disposed of in refuse bins supplied and maintained by Contractor. Location of refuse bins shall be as agreed to by City of Winnipeg.

1.3 Pollution Control

.1 Prevent sandblasting and other dust and aerosol-producing procedures from contaminating air beyond application area, by providing temporary enclosures and/or other control methods. If necessary, arrange for shutdown of air handling units which have air intakes in the vicinity of the Work.

Take precautions to prevent dust from triggering fire alarm smoke detectors and plugging ducts and filters. If necessary, arrange for shutdown of this equipment. Contractor shall be responsible for all damages.

Prior to start of Work, identify locations of air intakes and air-cooled mechanical and electrical equipment within and adjacent to the area of Work and protect them from entry of dust and air borne particles from construction activity.

.2 Control noxious and hazardous gases. Prevent hazardous accumulations. Control emission from equipment and plant to local authority's emission requirements.

.3 On exterior, cover or wet down dry materials and rubbish to prevent blowing dust and debris.

1.4 Workplace Hazardous Materials Information System

.1 The Contractor is responsible for securing Materials Safety Data Sheets relating to specified products or other regulated products and materials that will be used on the Work Site, including those materials not specified herein. Maintain file of MSDS sheets at Site office.

.2 The Contractor, at award of the Contract, and as Work progresses, will submit copies of all pertinent Materials Safety Data Sheets.

.3 The Contractor is responsible for making available to his employees and subcontractors, hazard information and warnings related to products specified herein as well as other products not specified but used.

.4 The Contractor will be held responsible for any damage, costs or losses to the City of Winnipeg, its employees, public and facilities by his failure to take the necessary precautions during the handling, storage and application of all products used for carrying out the Work.

.5 Storage of hazardous materials within or around the facility will not be allowed.

~ END ~

1.1 Abbreviations

AA	Aluminum Association 750 Third Avenue, New York, New York, U.S.A. 10017
AMCA	Air Movement and Control Association Inc. 30 West University Drive, Arlington Heights, Illinois, U.S.A. 60004-1893
ANSI	American National Standards Institute 1430 Broadway, New York, New York, U.S.A. 10018
ARI	Air Conditioning and Refrigeration Institute 1815 North Fort Myer Drive, Arlington, Virginia, U.S.A. 22209
ASHRAE	American Society of Heating, Refrigeration and Air-Conditioning Engineers 1791 Tullie Circle NE, Atlanta, Georgia, U.S.A. 30329
ASME	American Society of Mechanical Engineers United Engineering Centre 345 East 47th Street, New York, New York, U.S.A. 10017
ASTM	American Society for Testing and Materials 1916 Race Street, Philadelphia, Pennsylvania, U.S.A. 19103
AWMAC	Architectural Woodwork Manufacturers Association of Canada Suite 242 – 4229 Canada Way, Burnaby, B.C. V5G 1H3
CGA	Canadian Gas Association 55 Scarsdale Road, Don Mills, Ontario M3B 2R3
CGSB	Canadian General Standards Board Place du Portage, Phase III, 9C1 11 Laurier Street, Hull, Quebec K1A 1G6
CISC	Canadian Institute of Steel Construction 201 Consumers Road, Suite 300, Willowdale, Ontario M2J 4G8
CMB	Construction Materials Board 101 Colonel By Drive, 8NT MGen George R. Pearkes Bldg., Ottawa, Ontario K1A 0K2
CSA	Canadian Standards Association 178 Rexdale Blvd., Rexdale, Ontario M9W 1R3
CSDFMA	Canadian Steel Door and Frame Manufacturing Association One Yonge Street, Suite 1400, Toronto, Ontario M5E 1J9
EEMAC	Electrical and Electronic Manufacturers' Association of Canada 1 Yonge Street, Suite 1608, Toronto, Ontario M5E 1R1
FCC	Fire Commissioner of Canada Place du Portage, Phase II, 165 rue Hotel de Ville, Ottawa, Ontario K1A 0J2
IEEE	Institute of Electrical and Electronics Engineers 345 East 47th Street, New York, New York, U.S.A. 10017
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 127 Park Street, N.E., Vienna, Virginia, U.S.A. 22180
NEMA	National Electrical Manufacturers Association 2101 L. Street N.W., Washington, D.C., U.S.A. 20037
NFPA	National Fire Protection Association Batterymarch Park, Quincy, Massachusetts U.S.A. 02269
NHLA	National Hardwood Lumber Association 332 X. Michigan Avenue, Chicago, Illinois U.S.A. 60604
NLGA	National Lumber Grades Authority 260-1055 West Hastings, Vancouver, B.C. V6E 2E9
NRC	National Research Council Montreal Road, Ottawa, Ontario K1A 0S2
SCC	Standards Council of Canada 1200-45 O'Connor Street, Ottawa, Ontario K1P 6N7
TTMAC	Terrazzo, Tile and Marble Association of Canada 30 Capston Gate, Unit 5, Concord, Ontario 4K 3E8
ULC	Underwriters' Laboratories of Canada 7 Crouse Road, Scarborough, Ontario M1R 3A9
UL	Underwriters Laboratories 333 Pfingsten Road, Northbrook, Illinois U.S.A. 60062

~ END ~

1.1 Reference Standards

.1 Within the text of the Product specifications, reference standards are identified. Conform to these standards, in whole or in part, as specifically requested in the specifications.

.2 Conform to latest date of issue of referenced standards in effect on date of submission of bids, except where a specific date or issue is specifically noted.

.3 In no instance shall the standard of quality of materials, products, and Workmanship established by these specifications and drawings be reduced by any of the specified reference standards.

1.2 Quality

.1 Products provided shall be new. Products which are not specified shall be of a quality consistent with those other products specified for the Work and their use acceptable to the Contract Administrator. Materials, equipment, and articles incorporated in the Work shall be new, not damaged or defective, and of the best quality for the purpose intended. If required, furnish evidence of type, source, and quality of products provided.

.2 Defective material, equipment, and articles whenever found at any time prior to the completion of Work will be rejected, regardless of previous reviews of the Work. Review by the Contract Administrator does not relieve responsibility but is merely a precaution against oversight or error. Remove and replace defective materials at own expense and be responsible for all unnecessary delays and expenses caused by rejection.

.3 Should any dispute arise as to the quality or fitness of materials, equipment, or articles, the decision rests strictly with the Contract Administrator, based upon the requirements of the Contract Documents.

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

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

1.3 Availability

.1 Immediately upon signing the Contract, review product delivery requirements and anticipate foreseeable supply delays for any items. If delays in supply of materials, equipment or articles are foreseeable, notify Contract Administrator of such in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In the event of failure to notify the Contract Administrator at commencement of Work, and should it subsequently appear that Work may be delayed for such reason, the Contract Administrator reserves the right to substitute more readily available products of similar character at no increase in Contract Price.

1.4 Product Delivery, Storage and Handling

.1 Handle and store products in a manner to prevent damage, adulteration, and deterioration, in accordance with manufacturer’s instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seals and labels intact. Do not remove from packaging or bundling until required in the Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Keep sand, when used for grout or mortar materials, clean and dry.

.5 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.6 Store and mix paints in a heated and well-ventilated room assigned for this purpose. Keep room under lock and key at all times. Remove oily rags and any other combustible debris from Site daily. Take every precaution necessary to prevent spontaneous combustion. Provide an operational fire extinguisher in the room at all times.

.7 Remove and replace damaged products at own expense and to the satisfaction of the Contract Administrator.

1.5 Transportation

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

1.6 Manufacturers' Direction and Instructions

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

.2 Notify Contract Administrator in writing of any conflicts between the Specifications and manufacturer's instructions so that the Contract Administrator may establish the course of action to follow.

.3 Improper installation or erection of products due to failure in complying with these requirements authorizes the Contract Administrator to require any removal and re-installation that may be considered necessary, at no increases in Contract Price.

1.7 Workmanship

.1 Workmanship is to be of the best quality, executed by Workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Contract Administrator if Work is required in such a manner as to make it impractical to produce required results.

.2 At all times, enforce discipline and good order among Workers. Do not employ any unfit person or anyone unskilled in the duties assigned to him. The Contract Administrator reserves the right to require the dismissal of Workers deemed incompetent, careless, insubordinate, or otherwise objectionable.

.3 Decisions as to quality of or fitness of Workmanship in cases of any dispute, rests solely with Contract Administrator whose decision is final.

1.8 Coordination

.1 Ensure full cooperation among Workers in laying out the Work. Maintain efficient and continuous supervision.

.2 Ensure that the Work of various Subcontractors does not conflict or create interference, thus assuring satisfactory performance of Work.

.3 Be responsible for the proper coordination and placement of openings, sleeves, and accessories.

.4 Supply items required to be built in, such as anchors, ties, dovetail slots, nailing strips, blocking, sleeves, as and when required, together with templates, measurements and shop drawings.

.5 Ensure Workers examine drawings and specifications covering the Work of others which may affect the performance of their own Work. Examine the Work of others and report to the Contract Administrator, in writing, any defects, or deficiencies that may affect the Work. In the absence of any report, the Contractor shall be held to have waived all claims for damage to or defects in such Work.

.6 Ensure components requiring foundations or openings that are required for the installation of this Work is coordinated. Furnish the necessary information to the Sections concerned in ample time to permit allowance for such items. Failure to comply with this requirement does not relieve the party at fault of the cost of cutting or drilling at a later date and subsequent patching.

1.9 Remedial Work

.1 The Contractor shall do cutting and remedial Work required to make several parts of the wrk come together properly.

.2 Perform remedial Work required to repair or replace the parts or portions of the Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.3 Perform remedial Work by specialists familiar with the materials affected. Perform in a manner to neither damage nor endanger any portion of Work.

1.10 Location of Fixtures

.1 Consider the location of fixtures, outlets and other mechanical and electrical items indicated on drawings as approximate.

.2 Inform the Contract Administrator of an impending installation. Install as directed.

1.11 Protection of Work in Progress

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

.2 Protect Work against damage by on going construction processes, vandalism, other causes.

1.12 Over Loading

.1 Prevent overloading of any part of the building. Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated without written approval of Contract Administrator.

~ END ~

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 21 00 – Allowances.

1.2 INSPECTION

.1 Allow Contract Administrator access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

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

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

.4 Contract Administrator will order 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.

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged for purpose of inspecting and/or testing portions of Work. Cost of such services will be paid by the Contractor via the testing cash allowance.

.2 Allocated costs: to Section 01 21 00 - Allowances.

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

.4 Employment of inspection/testing agencies does not relax 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 defects and irregularities as advised by Contract Administrator at no cost to City of Winnipeg. Pay costs for retesting and reinspection.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work.

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

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

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

1.6 REJECTED WORK

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

.2 Make good other Contractor's Work damaged by such removals or replacements promptly.

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

1.7 REPORTS

.1 Submit copies of inspection and test reports to City of Winnipeg and Contract Administrator.

.2 Provide copies to subcontractor of work being inspected.

.3 Provide copies of concrete test results to Concrete Supplier.

1.8 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Contract Administrator and may be authorized as recoverable.

1.9 MILL TESTS

.1 Submit mill test certificates as requested.

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 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute Work expeditiously.

.2 Remove from Site all such Work after use.

1.2 WATER SUPPLY

.1 Contractor is to supply own potable water for construction use at own cost.

1.3 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders are not permitted.

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

- .1 Facilitate progress of Work.
- .2 Protect Work and products against dampness and cold.
- .3 Prevent moisture condensation on surfaces.
- .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
- .5 Provide adequate ventilation to meet health regulations for safe Working environment.

.4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.

.5 Ventilating:

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

.6 Permanent heating system of building may be used for heating but only as supplementary heat source. Be responsible for damage to heating system if use is permitted.

.7 Pay costs for maintaining temporary heat.

.8 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

.5 Vent direct-fired combustion units to outside.

.9 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.4 TEMPORARY POWER AND LIGHT

.1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools.

.2 Contractor is to supply its own power as required for construction at own cost.

.3 Provide and maintain temporary lighting throughout project.

1.5 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for cellular telephone for Site superintendent

1.6 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

.2 Provide full-time fire watch personnel while completing any heat-generating activities prior to closing in the roof structure.

.3 Burning rubbish and construction waste materials is not permitted on Site.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

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

.2 CSA O121-08, Douglas Fir Plywood.

1.2 SUBMITTALS

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

1.3 SCAFFOLDING

.1 Install scaffolding to provide contractor access to the construction area and to support temporary shelter while roof of building is open. Provide and maintain scaffolding, insulated weather cover, and access as required throughout duration of the Work.

.2 Scaffolding shall be designed and erected in accordance with Manitoba Regulation 217/2006 and CAN/CSA S269.2.

.1 Submit shop drawings bearing the seal of professional engineer registered in the Province of Manitoba.

1.4 WORK PLATFORMS

.1 Install Work platforms as required to protect exposed attic floor (2^{nd} floor ceiling) structure from damage due to impact, moisture, or other construction-related disturbances. This structure supports plaster ceiling finishes that are highly susceptible to movement, vibration, and deflection of the structure. Temporary Work platforms are required to protect this structure and the affected finishes from damage during installation of the new roof structure.

.2 Work platforms shall be designed and erected in accordance with Manitoba Regulation 217/2006 and the Manitoba Building Code 2011.

.1 Submit shop drawings bearing the seal of professional engineer registered in the Province of Manitoba.

1.5 SITE STORAGE/LOADING

.1 Confine Work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.6 CONSTRUCTION PARKING

.1 The Contractor will be provided with two (2) stalls at this at-grade asphalt parking lot, Maintain such areas for duration of Contract and make good damage resulting from Contractors' use.

1.7 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on Site in manner to cause least interference with Work activities.

1.8 SANITARY FACILITIES

.1 Provide sanitary facilities for Work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.9 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from Work Site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

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 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from Site all such Work after use.

1.2 SUBMITTALS

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

1.3 WEATHER ENCLOSURES

.1 Provide full enclosure of open roof area for duration of Work being undertaken. Design enclosures to withstand wind pressure and snow loading. Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

.2 Design enclosures to withstand wind pressure and snow loading.

.3 Enclosures shall be designed and erected in accordance with Manitoba Regulation 217/2006 and the Manitoba Building Code 2011.

.1 Submit shop drawings bearing the seal of professional engineer registered in the Province of Manitoba.

1.4 HOARDING

.1 The Contractor must barricade off the area under construction to prevent the general public from improper access to the construction area. Suitable barricades and protection systems shall include temporary metal construction fencing, minimum 6’-0” high, around all scaffolding areas and all areas that may pose a risk to public safety.

.2 Repair surface coatings and/or finishes which are damaged by temporary hoardings and barricades.

.3 Provide adequate signage, fencing, etc. to inform the public of the Work being undertaken.

.4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.

1.5 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.6 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.7 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Be responsible for damage incurred due to lack of or improper protection.

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 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by City of Winnipeg or other Contractors.

.2 Remove waste materials from Site at daily regularly scheduled times. Do not burn waste materials on Site.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide on-Site containers for collection of waste materials and debris.

.5 Dispose of waste materials and debris off Site.

.6 Clean interior areas prior to start of finishing Work, and maintain areas free of dust and other contaminants during finishing operations.

.7 Store volatile waste in covered metal containers, and remove from premises at end of each Working day.

.8 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.9 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris other than that caused by City of Winnipeg or other Contractors.

.5 Remove waste materials from Site at regularly scheduled times. Do not burn waste materials on Site.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.7 Remove stains, spots, marks and dirt from existing surfaces, fixtures, and finishes within the Work area or affected by the affected by the Work.

.8 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.9 Remove dirt and other disfiguration from exterior surfaces.

.10 Mechanically clean all roof drain lines.

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 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Prior to Substantial Performance of the Work submit maintenance/operating manuals, necessary data and operation instructions, evidence of satisfactory results of all necessary tests, warranties, bonds, record and "as-built" drawings, service and maintenance contracts, spare parts and maintenance materials, receipts for salvage items, etc. and instruct City of Winnipeg's personnel regarding all systems installed. The following shall be 100% complete, to the satisfaction of the City of Winnipeg, prior to Certificate of Substantial Performance being issued:

.1 Maintenance/Operating Manuals.

.2 All record and "as-built" drawings.

.3 Systems orientation for City of Winnipeg's personnel.

.4 All spare parts and maintenance materials have been turned over to the City of Winnipeg.

.5 Warranty and Bond Certificates.

.2 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Contract Administrator in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Contract Administrator's inspection.

.3 Contract Administrator's Review:

.1 Contract Administrator and Contractor to review Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.4 Completion Tasks: submit written certificates that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Work: complete and ready for final inspection.

.5 Final Review:

.1 When completion tasks are done, request final review of Work by Contract Administrator, and Contractor.

.2 When Work incomplete according to Contract Administrator, complete outstanding items and request another review.

.6 Declaration of Substantial Performance: when Contract Administrator considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.7 Commencement of Lien and Warranty Periods: date of City of Winnipeg's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.1 City of Winnipeg shall give prompt notice in writing to the Contractor and Contract Administrator of any defects (as defined by Contract) noted during warranty period. Contractor shall promptly remedy defects(s) within time period. Failure to do so will make Contractor financially responsible to City of Winnipeg for repairs (material and labour) by qualified personnel. Emergency or other repairs by qualified personnel under the direction of City of Winnipeg shall not nullify the warranty.

.2 During month prior to end of warranty period, City of Winnipeg, Contract Administrator and Contractor shall conduct a review of project; Contractor shall promptly remedy defects due to faulty materials or Workmanship of the Work of Contract. Contractor shall remedy defects (s) within time period agreed to between City of Winnipeg and Contractor. Failure to do so will make Contractor financially responsible to City of Winnipeg for repairs (material and labour) by qualified personnel. Emergency or other repairs by qualified personnel under the direction of City of Winnipeg shall not nullify the warranty.

.8 Final Payment:

.1 When Contract Administrator considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.2 Refer to City of Winnipeg General Conditions: when Work deemed incomplete by Contract Administrator, complete outstanding items and request re-inspection.

.9 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.2 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 – Cleaning.

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

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

PART 1 General

1.1 SUBMISSION

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
.2 Copy will be returned after final inspection, with Contract Administrator's comments.
.3 Revise content of documents as required prior to final submittal.
.4 Two weeks prior to Substantial Performance of the Work, submit to the Contract Administrator, three final copies of operating and maintenance manuals in English.
.5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
.6 If requested, furnish evidence as to type, source and quality of products provided.
.7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
.8 Pay costs of transportation.

1.2 FORMAT

.1 Organize data in the form of an instructional manual.
.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
.4 Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
.5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
.6 Provide tabbed flyleaf for each separate product and system, with typed description of product and major component parts of equipment.
.7 Text: Manufacturer's printed data, or typewritten data.
.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
.9 Provide 1:1 scaled CAD files in dwg format on CD.

1.3 CONTENTS - EACH VOLUME

.1 Table of Contents: provide title of project;
    .1 date of submission; names,
    .2 addresses, and telephone numbers of Contract Administrator and Contractor with name of responsible parties;
    .3 schedule of products and systems, indexed to content of volume.
.2 For each product or system:
    .1 list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
    .2 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
    .3 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
    .4 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 43 00 Quality Assurance.

1.4 AS BUILTS AND SAMPLES

.1 In addition to requirements in General Conditions, maintain at the Site for Contract Administrator one record copy of:
    .1 Contract Drawings.
    .2 Specifications.
    .3 Addenda.
    .4 Change Orders and other modifications to the Contract.
    .5 Reviewed shop drawings, product data, and samples.
    .6 Field test records.

.7 Inspection certificates.
.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
.5 Keep record documents and samples available for inspection by Contract Administrator.

1.5 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Contract Administrator.
.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
.1 Measured depths of elements of foundation in relation to finish first floor datum.
.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
.4 Field changes of dimension and detail.
.5 Changes made by change orders.
.6 Details not on original Contract Drawings.
.7 References to related shop drawings and modifications.
.5 Specifications: legibly mark each item to record actual construction, including:
.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Addenda and change orders.
.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.6 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
.2 Maintenance Requirements: include routine procedures and guide for trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
.3 Include manufacturer's printed operation and maintenance instructions.
.4 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
.5 Additional requirements: As specified in individual specification sections.

1.7 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re ordering custom manufactured products.
.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
.3 Moisture protection and Weather exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
.4 Additional Requirements: as specified in individual specifications sections.

1.9 MAINTENANCE MATERIALS

.1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
.2 Provide items of same manufacture and quality as items in Work.
.3 Deliver to Site; place and store as directed by The City.
.4 Receive and catalogue all items. Submit inventory listing to Contract Administrator. Include approved listings in Maintenance Manual.
.5 Obtain receipt for delivered products and submit prior to final payment.

1.12 WARRANTIES AND BONDS

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
.2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of Work.
.4 Except for items put into use with The City's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.
.5 Verify that documents are in proper form, contain full information, and are notarized.
.6 Co execute submittals when required.
.7 Retain warranties and bonds until time specified for submittal.

~ END ~

Part 1 General

1.1 SECTION INCLUDES

.1 Methods and procedures for deconstruction of parts of structures.

1.2 REFERENCES

.1 Definitions:

.1 Alternate Disposal: reuse and recycling of materials by designated facility, user or receiving organization which has valid Certificate of Approval to operate. Alternative to landfill disposal.

.2 Deconstruction: systematic dismantling of structure in a manner that achieves safe removal/disposal of hazardous materials and maximum salvage/recycling of materials.

.1 Ultimate objective is to recover potentially valuable resources while diverting from landfill what has traditionally been significant portion of waste system.

.3 Demolition: rapid destruction of structure with or without prior removal of hazardous materials.

.4 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, including but not limited to: corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health, well being or environment if handled improperly.

.5 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.6 Source Separation: acts of keeping different types of waste materials separate, beginning from first time they became waste.

.7 Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

.2 Reference Standards:

.1 Canadian Standards Association (CSA International)

.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

.2 Federal Legislation

.1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.

.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.3 National Building Code 2010, Part 8 - Safety Measures at Construction and Demolition Sites

1.3 SITE CONDITIONS

.1 Existing Conditions:

.1 Should materials resembling spray or trowel applied asbestos or other designated substance listed as hazardous be encountered in course of deconstruction, stop Work, take preventative measures, and notify Contract Administrator immediately. Do not proceed until written instructions have been received.

.2 Label and package component parts of mechanical and electrical material specified for salvage to prevent damage or loss.

.2 Structures to be demolished are identified on the Drawings. Exercise extreme caution to preserve portions of structure to remain.

.3 Protection:

.1 Prevent movement, settlement or damage of adjacent structures, finishes, services, paving, trees, landscaping, adjacent grades. Provide bracing as required. Repair damage caused by deconstruction as directed by Contract Administrator.

.2 Support affected structures and, if safety of structure being deconstructed or adjacent structures appears to be endangered, take preventative measures. Cease operations and immediately notify Contract Administrator.

.3 Prevent debris from blocking roof drainage system, elevators, mechanical and electrical systems.

Part 2 Products

2.1 EQUIPMENT

.1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.

.2 Demonstrate that tools are being used in manner which allows for minimal disturbance of structures and finishes to remain.

Part 3 Execution

3.1 PREPARATION

.1 Locate and protect utility lines. Do not disrupt active or energized utilities designated to remain undisturbed.

.2 Disconnect and cap mechanical and electrical services as required for removal of roof structure.

3.2 DISASSEMBLY

.1 Materials removed from designated structure are property of Contractor.

.2 Throughout course of deconstruction pay close attention to connections and material assemblies. Employ Workmanship procedures which minimize damage to materials and equipment.

.3 Ensure Workers and subcontractors are trained to carry out Work in accordance with appropriate deconstruction techniques.

.4 Project supervisor with previous deconstruction experience must be present on Site throughout demolition portion of project.

.5 Deconstruct in accordance with CSA S350 and other applicable safety standards.

.6 Workers must utilize adequate fall protection where necessary.

.7 Maintain structural integrity of structure.

.8 Systematically remove finishes, furnishings, and mechanical and electrical equipment as required.

.9 Disassemble in sequence: roof sheathing, roof rafters and pony walls, roof beams as indicated on the drawings.

.10 Contractor to provide plan for reusing and recycling as much of the roof structure as possible for approval by Contract Administrator. Remove materials that cannot be salvaged for reuse or recycling and dispose of in accordance with applicable codes at licensed facilities.

3.3 REMOVAL FROM SITE

.1 Dispose of materials in accordance with applicable regulations at regularly scheduled times to avoid accumulation of waste materials on Site.

3.4 CLEANING AND RESTORATION

.1 Keep Site clean and organized throughout deconstruction.

.2 Upon completion of project, remove debris, trim surfaces and leave Work Site clean.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 20 00 – Concrete Reinforcing.

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

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

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

.2 CSA O121-2008, Douglas Fir Plywood.

.3 CSA O151-09, Canadian Softwood Plywood.

.4 CSA O153-M1980(R2008), Poplar Plywood.

.5 CSA-O325-07, Construction Sheathing.

.6 CSA O437 Series-93(R2006), Standards for OSB and Waferboard.

.7 CSA-O86-09, Engineering Design in Wood.

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

.9 CAN/CSA-S269.3-M92(R2008), Concrete Formwork, National Standard of Canada

1.3 MEASUREMENT PROCEDURES

.1 No measurement will be made under this Section. Include costs in items of Work for which concrete formwork and falsework is required.

1.4 SUBMITTALS

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

.2 Submit shop drawings for formwork and falsework.

.1 Upon request Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada. (Note: This is mandatory for suspended slabs).

.3 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings. Comply with CAN/CSA-S269.3 for formwork drawings.

.4 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

Part 2 Products

2.1 MATERIALS

.1 Formwork materials:

.1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121, CAN/CSA-O86, and CSA-O153.

.2 For concrete with special architectural features, use formwork materials to CSA-A23.1/A23.2.

.2 Pan forms: removable steel, or reinforced plastic to match existing profiles and dimensions.

.3 Tubular column forms: round, internally treated with release material.

.1 Spiral pattern may show in hardened concrete, except where column is designated architectural finish, where it shall not show in hardened concrete.

.4 Form ties:

.1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

.2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.

.5 Form liner:

.1 Plywood: high density overlay.

.6 Form release agent: non-toxic, biodegradable, low VOC.

.7 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene.

.8 Falsework materials: to CSA-S269.1.

Part 3 Execution

3.1 FABRICATION AND ERECTION

.1 Fabricate and erect falsework in accordance with CSA S269.1.

.2 Refer to drawings for concrete members requiring architectural exposed finishes.

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

.4 Provide Site drainage to prevent washout of soil supporting mud sills and shores.

.5 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.

.6 Align form joints and make watertight. Keep form joints to minimum.

.7 Locate horizontal form joints for exposed columns 2400 mm above finished floor elevation.

.8 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.

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

.10 Construct forms for architectural concrete, and place ties as indicated and as directed. Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.11 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.12 Line forms for following surfaces:

- .1 Surfaces designated as architectural finish.
- .2 Secure lining taut to formwork to prevent folds.
- .3 Pull down lining over edges of formwork panels.
- .4 Ensure lining is new and not reused material.
- .5 Ensure lining is dry and free of oil when concrete is poured.
- .6 Application of form release agents on formwork surface is prohibited where drainage lining is used.
- .7 If concrete surfaces require cleaning after form removal, use only pressurized water stream so as not to alter concrete's smooth finish.
- .8 Cost of textile lining is included in price of concrete for corresponding portion of Work.

.13 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

.1 Notify Contract Administrator 24 hours in advance prior to removing formwork.

.2 Do not remove forms and bracing until concrete has gained sufficient strength to carry its own weight, construction loads, design loads that are liable to be imposed upon it. Verify strength of concrete by compressive test results.

.3 Leave formwork in place for following minimum periods of time after placing concrete:

LOCATION	TEMPERATURE IN °C		
	21-35	15-21	10-15
Walls	2 days	3 days	4 days
Side Forms	2 days	3 days	4 days

Slabs *	7 days	7 days	14 days
Beams *	7 days	7 days	14 days
Structural Shoring *	7 days	7 days	14 days

* formwork below/supporting these elements shall remain in place for the minimums stated above and then replaced with shoring posts until concrete is 28 days old. Formwork can be removed and replaced with shoring posts earlier, if concrete test cylinders show a strength of 75% of the required 28 day strength.

.4 Reshore structural members where required due to design requirements or construction conditions and as required to permit progressive construction.

.5 Remove formwork progressively and in accordance with Building and Safety Code requirements and so that no shock loads or unbalanced loads are imposed on structure.

.6 Loosen forms carefully. Do not wedge pry bars, hammers, or tools against concrete surfaces.

.7 Store removed forms, for exposed concrete, so surfaces in contact with fresh concrete will not be damaged. Marked or scored forms will be rejected.

.8 Re-use formwork subject to requirements of CAN/CSA-A23.1.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forming and Accessories.

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

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

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

.2 CAN/CSA-G30.18-09, Billet-Steel Bars for Concrete Reinforcement, A National Standard of Canada.

.3 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.4 CAN/CSA-G164-M92(R2003)(withdrawn), Hot Dip Galvanizing of Irregularly Shaped Articles, A National Standard of Canada.

.5 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.

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

.1 ASTM A82-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.2 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

.3 ASTM A775/A775M-07b, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.

.3 Reinforcing Steel Institute of Canada (RSIC)

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

1.3 MEASUREMENT PROCEDURES

.1 Reinforcing steel will be measured in kilograms of steel incorporated into Work, computed from theoretical unit mass specified in CAN/CSA G30.18 for lengths and sizes of bars as indicated.

.2 No measurement will be made under this Section.

.1 Include reinforcement costs in items of concrete Work in Section 03 30 00 - Cast-In-Place Concrete.

1.4 SUBMITTALS

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

.2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.

.3 Submit shop drawings including placing of reinforcement and indicate:

.1 Bar bending details.

.2 Lists.

.3 Quantities of reinforcement.

.4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Contract Administrator, with identifying code marks to permit correct placement without reference to structural drawings.

.5 Indicate sizes, spacings and locations of chairs, spacers and hangers.

.4 Detail lap lengths and bar development lengths to CSA-A23.3, unless otherwise indicated.

.1 Provide class B tension lap splices unless otherwise indicated.

Part 2 Products

2.1 MATERIALS

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

.2 Reinforcing steel: All reinforcing steel to be CAN/CSA-G30.18M grade 400R deformed bars except column ties and beam stirrups which shall be grade 400W.

.3 Cold drawn annealed steel wire ties: to ASTM A82.

.4 Welded steel wire fabric: to ASTM A185/A185M. Provide in flat sheets only.

.5 Epoxy Coating of non-prestressed reinforcement: to ASTM A775/A775M.

.6 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164, minimum zinc coating 610 g/m^2.

.7 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

.8 Mechanical splices: subject to approval of Contract Administrator.

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

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

.2 All reinforcing is to be detailed in accordance with the latest edition of the Reinforcing Steel Institute of Canada - Manual of Standard Practice, except otherwise noted

.3 Obtain Contract Administrator's approval for locations of reinforcement splices other than those shown on placing drawings.

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

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

.1 Ship epoxy coated bars in accordance with ASTM A775A/A775M.

2.3 SOURCE QUALITY CONTROL

.1 Upon request, provide Contract Administrator with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.

.2 Upon request inform Contract Administrator of proposed source of material to be supplied.

Part 3 Execution

3.1 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Contract Administrator.

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

.3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.

.2 Use plain round bars as slip dowels in concrete where noted on the drawings.

.1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.

.2 When paint is dry, apply thick even film of mineral lubricating grease.

.3 Prior to placing concrete, obtain Contract Administrator's approval of reinforcing material and placement.

.4 Ensure cover to reinforcement is maintained during concrete pour.

.5 Protect epoxy coated portions of bars with covering during transportation and handling.

3.3 DOWELING PROCEDURES

.1 For bars that are indicated as being dowelled in, drill in and epoxy grout bars as follows:

.1 10M bars, 200 mm

.2 15M bars, 250 mm

.3 20M bars, 350 mm

.4 25M bars, 400 mm

.2 Use only approved adhesive to manufacturer’s instructions. Acceptable product:

.1 Hilti HIT HY-150 MAX/HIT-ICE by Hilti Canada.

.3 Clean hole thoroughly prior to application of epoxy. Use injection or caulking gun to ensure that the epoxy fills the bottom of the hole prior to embedment of bar.

3.4 FIELD TOUCH-UP

.1 Touch up damaged and cut ends of epoxy coated reinforcing steel with compatible finish to provide continuous coating.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forming and Accessories.

.2 Section 03 20 00 – Concrete Reinforcing.

1.2 REFERENCES

.1 Canadian Standards Association (CSA)

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

.2 CAN/CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005)

.3 CSA A283-06, Qualification Code for Concrete Testing Laboratories.

.2 American Concrete Institute (ACI)

.1 ACI 309R-96, Guide for the Consolidation of Concrete.

.2 [ACI 544.3R-93(1998), Guide for the Specifying, Proportioning, Mixing, Placing, and Finishing of Steel Fibre Reinforced Concrete.]

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

.1 ASTM C260-01, Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-03, Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M-05, Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM A820/A820M-04, Standard Specification for Steel Fibers for Fiber-Reinforced Concrete.

.5 ASTM C1116/C1116M-09, Standard Specification for Fiber- Reinforced Concrete.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

1.3 MEASUREMENT PROCEDURES

.1 Cast-in-place concrete will not be measured but will paid for as a fixed price item.

1.4 CERTIFICATES

.1 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. Certification letter to be sealed by an engineer registered in the Province of Manitoba.

.2 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CSA-A23.1. Certification letter to be sealed by an engineer registered in the Province of Manitoba.

1.5 QUALITY ASSURANCE

.1 Minimum 4 weeks prior to starting concrete Work, submit proposed quality control procedures for review by Contract Administrator on following items:

.1 FalseWork erection.
.2 Hot weather concrete.
.3 Cold weather concrete.
.4 Curing.
.5 Finishes.
.6 FormWork removal.
.7 Joints.

1.6 ABBREVIATIONS

.1 Cement: hydraulic cement or blended hydraulic cement (XXb - where b denotes blended).

.1 Type GU or GUb - General use cement.
.2 Type HS or HSb - High sulphate-resistant cement.

.2 Fly ash:

.1 Type CI - with CaO content ranging from 8 to 20%.

.3 SCM – Supplemental cementing materials.

.4 SSD - Saturated surface dry.

.5 WRA – Water reducing agent.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Concrete hauling time: maximum allowable time 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 Contract Administrator and concrete producer as described in CSA A23.1/A23.2.
.2 Deviations to be submitted for review by Contract Administrator.

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

Part 2 Products

2.1 MATERIALS

.1 The concrete constituents shall comply with the following standards:

.1 Cement: to CAN/CSA-A3001.

.2 Blended Hydraulic cement: to CAN/CSA-A3001.

.3 Supplementary cementing materials: to CAN/CSA-A3001.

.4 Water: To CSA-A23.1.

.5 Aggregates: to CSA-A23.1. Coarse aggregates to be normal density.

.6 Air entraining admixture: ASTM C260.

.7 Chemical admixtures: ASTM C494/C494M. Contract Administrator to approve accelerating or set retarding admixtures during cold and hot weather.

2.2 MIX REQUIREMENTS

.1 Proportion normal density concrete in accordance with CSA-A23.1, Alternative 1 to give the properties as indicated on the structural drawings.

.2 In order to contribute to the LEED standing of the building, the concrete shall have a minimum fly ash content of 30% by mass of total cementing materials, unless approved by the Contract Administrator. Fly ash contents that produce a high volume of supplementary cementing materials (HVSCM) as defined in CSA-A23.1, section 8.8, shall not be permitted unless the contractor meets the following requirements:

.1 The Materials, and mix shall conform to CSA-A23.1, section 8.8.

.2 The contractor shall submit a curing plan for approval by the Contract Administrator as per CSA-A23.1, section 8.8. The plan shall provide details for the protection and curing of the HVSCM, including:

.1 The method for protecting the concrete from evaporation of surface moisture from the fresh concrete;

.2 The type of curing material to be used;

.3 How the surface will be kept moist, and the quality control requirements for keeping the surface moist;

.4 The time of initiation and duration of curing;

.5 Provisions to address potential problems such as high winds and hot and cold weather; and

.6 The limitations of access, if any, to the surfaces being cured.

.3 The curing type shall conform to CSA-A23.1, Table 2, and shall depend on the volume of supplementary cementing materials.

.4 Slump at point of discharge: consistent with placement and consolidation methods, equipment, and Site conditions and as approved by Contract Administrator.

2.3 BONDING SLURRY WHERE CONCRETE IS CAST AGAINST HARDENED CONCRETE

.1 The bonding slurry shall consist of a cement/sand grout mixed in a 1:1 ratio by weight to a maximum water/cement ratio of 0.40 in accordance with CSA-A23.1 and as follows:

.1 1.0 kg Type GU to CSA A3001.

.2 1.0 kg SSD concrete sand to CSA A23.1.

.3 0.40 kg Water to CSA A23.1.

.4 High range water reducing agent to ASTM C494/C494M as required and approved by Contract Administrator.

.5 Volume batching will be permitted provided the volumes are calibrated by weight prior to batching. The measuring containers shall be clearly labelled, indicating material type, calibrated weight of material, and calibrated volume. The Contract Administrator reserves the right to randomly check batch weights.

.6 Shovel batching is strictly prohibited.

.2 Alternative Method: Plastic concrete from same mix utilized for overlying concrete. Scrub plastic concrete. Scrub plastic concrete into substrate with stiff bristled broom or brush to produce a uniform thickness of 1/8" over entire area. Collect and remove all coarse aggregate prior to placement of the overlay.

2.4 ACCESSORIES

.1 Evaporation retardant: Acceptable Product:

.1 Confilm by BASF Building Systems at a minimum application rate of 4.9 m²/L.

.2 Cure and sealing compound: to ASTM C309, Type 1. Acceptable product(s):

.1 Florseal WB by Sika Canada Inc. at a minimum application rate of 4.9 m²/L.

.2 Kure-N-Seal by BASF Building Systems at a minimum application rate of 4.9 m²/L.

.3 Vapour Barrier: 10 mil polyethylene film to CAN/CGSB-51.34.

.4 Grout: Portland Cement based non-shrink, non-metallic composition and shall meet the following requirements:

.1 The grout shall not exhibit bleeding or segregation at pumpable consistency.

.2 Compressive Strength: 25 MPa @ 1 day.

.3 Bond Strength (ASTM C882) 13 MPa @ 28 days.

.4 Positive expansion confirmed by ASTM C827.

.5 The grout shall not produce a vapour barrier.

.6 Acceptable products are one of the following only

.1 Sika Grout 212 by Sika Canada Inc.

.2 Sternson M-Bed Standard by Sternson Construction Products.

.7 Alternatives to the above will be considered provided the product meets or exceeds the aforementioned performance requirements and at least three references are available detailing similar installations.

.5 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 25 MPa at 28 days.

.6 Ribbed waterstops: extruded PVC of sizes indicated with shop welded corner and intersecting pieces with legs not less than 3 inches long:

.1 Tensile strength: to ASTM D412, minimum 8.0 MPa.

.2 Elongation: to ASTM D412, minimum 275%.

.3 Tear resistance: to ASTM D624, minimum 26.0 kN/m.

.4 Acceptable Product: RB6-14 by Vinylex Corporation

.7 Premoulded joint fillers:

.1 Bituminous impregnated fiber board: to ASTM D1751.

Part 3 Execution

3.1 PREPARATION

.1 Obtain Contract Administrator's approval before placing concrete. Provide 24 hours notice prior to placing of concrete.

.2 Ensure reinforcement and inserts are not disturbed during concrete placement.

.3 Prior to placing of concrete obtain Contract Administrator's approval of proposed method for protection of concrete during placing and curing in adverse weather. Protection and curing must comply with the hot weather and cold weather requirements of CSA-A23.1.

.4 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.5 In locations where new concrete is dowelled to existing Work, drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and epoxy grout to anchor and hold dowels in positions as indicated. Refer to Section 03200.

.6 Do not place load upon new concrete until authorized by Contract Administrator.

.7 Provide formwork and falsework to Section 03100 - Concrete Forms and Accessories.

.8 Place reinforcing steel and install dowels to Section 03200 - Concrete Reinforcement. Provide dowels at locations shown on the drawings.

.9 Provide temporary bridging as required to permit access to all areas during placement, finishing and curing.

.10 Do not place concrete until screed rails for hand operated strike-off devices are in place and firmly secured.

.1 Rails to be of type, and so installed, that no springing or deflection will occur due to weight of finishing equipment.

.2 Set rails or headers to elevations to produce deck true to required grade and cross section.

.3 Use polyethylene film or plastic coated tape if necessary to prevent concrete from bonding to rails.

.4 Do not treat rails with release agents or parting compounds.

.5 Subject to approval of the Contract Administrator, screed rail anchors which remain in the concrete may be used provided they are non-corroding and sit a minimum of 30 mm below the finished surface of the concrete.

.11 Surface Preparation of Hardened Concrete

.1 All horizontal and vertical concrete surfaces to which new concrete is to bond to concrete which has reached final set to be prepared using specified surface preparation equipment to remove loose and deteriorated concrete, laitance, dust, dirt, oil, curing compound and any other material that could inhibit bond. Follow surface preparation procedures outlined under this specification.

.2 Within 24 hours prior to placement, high pressure water blast the surface at minimum 27.5 MPa (4,000 p.s.i.) to remove contaminants, laitance, curing compounds or other surface defects which will reduce the bond of the new concrete.

.3 Unless otherwise approved by the Contract Administrator, the surface of the concrete must be maintained in a saturated condition until immediately prior to concrete placement. If the concrete surface becomes wet and subsequently dries, the surface preparation and cleaning procedure must be repeated.

.4 The surface must be maintained in a clean condition using polyethylene film or other suitable clean covers until concrete is ready to be placed.

.5 No traffic shall be allowed on the prepared surface.

.6 The cleaned and prepared surface should be thoroughly wetted and maintained in a saturated condition for a period of not less than two (2) hours prior to concrete placement. Do not allow the concrete surface to dry.

.12 Bonding Fresh Concrete to Hardened Concrete

.1 Unless otherwise approved by the Contract Administrator, all concrete cast against hardened concrete shall be bonded using the methods outlined below.

.2 Immediately prior to application of the bonding slurry the concrete substrate to be SSD with no standing water. A SSD substrate typically exhibits a colour change of dark grey to light grey.

.3 Any standing water remaining on the substrate must be removed prior to applicaton of the bonding slurry by vacuuming, air blasting with oil free compressed air, or a combination thereof. Particularly attention should be paid to areas where water may collect such as depressions, holes, or areas of concrete removal.

.4 Apply bonding slurry to SSD substrate just prior to placing of concrete.

.5 Broom bonding slurry vigorously into the surface.

.6 Scrub the bonding slurry into the substrate while the concrete is SSD.

.7 Bonding slurry shall be applied to horizontal and vertical surfaces.

.8 Do not apply more bonding than can be covered with concrete before it dries. Place concrete while the bonding agent is still plastic. Do not retemper the bond slurry.

.9 If the bonding slurry dries prior to placement of the concrete, removal of the dried slurry will be required. The concrete surface will then be cleaned and prepared in accordance with the requirements described in the previous sections. The bonding grout shall then be reapplied as discussed under this section.

3.2 MIX PRODUCTION

.1 Concrete to be mixed, delivered and placed in accordance with CSA A23.1.

.2 Concrete to be batched and mixed at a ready mix plant and delivered to Site in ready to place form.

.3 Control of slump on the job Site to be in accordance with CSA-A23.1 except as otherwise specified below:

.1 The addition of water to increase slump is strictly prohibited unless prior written permission from concrete supplier is obtained.

.2 The use of WRA may be required to aid in placement of the concrete and obtain adequate consolidation in heavily reinforced sections.

.3 WRA addition shall occur at the batch plant or on Site. For Site addition, concrete supplier to provide written notice minimum 2 weeks prior to commencement of concrete Work, indicating recommended dosages based on slump at point of discharge.

.4 Site addition WRA will be the responsibility of the concrete supplier.

.4 Slump and air must be measured both before and after addition of WRA.

.5 The addition of water to the concrete to increase slump and aid in pumping is strictly forbidden

3.3 PLACEMENT

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

.2 Concrete shall be transported to placement location by pump or trolley.

.3 When concrete is placed by pump, the initial slurry used to prime the pump shall not be incorporated into the topping. The slurry shall be trapped and disposed off-Site.

.4 Ensure high points and slopes to drains as shown on drawings are maintained.

.5 When placing concrete against concrete that has achieved initial set, wait until final set occurs; then prepare the surface and treat like any other cured concrete surface being prepared for concrete.

.6 Place concrete in its final position as soon as possible after mixing. A maximum time limit of 120 minutes from the time of initial mixing to complete discharge shall be observed. Do not use any concrete more than 120 minutes from initial mixing or having a partial set before placing. Exemptions to the maximum time limit, if required, shall be submitted to the Contract Administrator in writing a minimum of 2 weeks prior to placement of concrete. Proposed methods and materials used to extend the maximum time limit shall be agreed upon by the Contract Administrator and the concrete supplier prior to placement of the concrete.

.7 Pour concrete continuously between predetermined construction and control joints. Do not break or interrupt successive pours such that cold joints occur. Install a construction dam or bulkhead in case of a delay longer than 60 minutes. During delays between 5 and 60 minutes, protect the end of the placement with damp burlap.

.8 Protect freshly placed concrete from exposure to dust, debris and precipitation.

.1 Special provisions for cold weather concrete placement shall be in accordance with Clause 7.4 of CSA A23.1-04 unless specifically noted otherwise.

.1 When the air temperature is at or below 5°C, or when there is a probability of it falling below 5°C within the entire curing period following placement, all materials and equipment needed for adequate protection and curing shall be on hand and ready for use before the concrete placement is started.

.2 During cold weather, as defined above, adequate protection of the concrete shall be provided for the duration of the required curing period. Protection shall be provided

by means of heated enclosures, coverings, insulation, or a suitable combination of these methods as defined in clause 7.4 of CSA A23.1-04.

.3 During cold weather concrete placement, after curing period, any water curing shall be terminated minimum 12 hours before removal of protection. To avoid cracking of the concrete due to a sudden temperature change near the end of the curing period, the protection shall not be completely removed until the concrete has cooled to a maximum temperature difference with the ambient air of 12 degrees Celsius.

3.4 CONSTRUCTION

.1 Sleeves and inserts.

.1 No sleeves, ducts, pipes or other openings shall pass through concrete members except where indicated or approved by Contract Administrator.

.2 Electrical conduits, junction and fixture boxes shall not be embedded within concrete members.

.3 Sleeves and openings greater than 100 x 100 mm not indicated, must be approved by Contract Administrator.

.4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Contract Administrator before placing of concrete.

.5 Check locations and sizes of sleeves and openings shown on drawings.

.6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.

.2 Anchor bolts:

.1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.

.2 Protect anchor bolt holes from water accumulations, snow and ice build ups.

.3 Drainage holes and weep holes:

.1 Form weep holes and drainage holes in accordance with Section 03 10 00 - Concrete Forming and Accessories. If wood forms are used, remove them after concrete has set.

.2 Install weep hole tubes and drains as indicated.

.4 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.

.5 Waterstops:

.1 Install waterstops to provide continuous water seal.

.2 Do not distort or pierce waterstop in way as to hamper performance.

.3 Do not displace reinforcement when installing waterstops.

.4 Use equipment to manufacturer's requirements to field splice waterstops.

.5 Tie waterstops rigidly in place.

.6 Use only straight heat sealed butt joints in field.

.7 Use factory welded corners and intersections unless otherwise approved by Contract Administrator.

.6 Joint fillers:

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Contract Administrator.

.2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.3 Locate and form construction joints as indicated.

.4 Install joint filler.

.5 Use 12mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12mm of finished slab surface unless indicated otherwise.

3.5 FINISHING

.1 Finish concrete in accordance with CSA-A23.1/A23.2.

.2 Consolidate concrete in accordance with CSA A23.1 and ACI 309.

.3 Under adverse conditions only, excess bleed water may be removed from the surface using procedures acceptable to Contract Administrator and those noted in CSA-A23.1. Ensure surface is not damaged.

.4 Immediately after final finishing apply approved evaporation retardant at indicated coverage rate. Evaporation retardant is not to be applied during finishing operations nor should it be Worked into the surface.

.5 Unless otherwise indicated round edges of formed joints in pavements with a 10 mm radius edging tool.

.6 Flatwork:

.1 Continuously consolidate and finish to specified elevations, ensuring thickness and required elevations are maintained.

.2 Use of a floating vibratory screed to consolidate the top surface of the concrete will be mandatory.

.1 The use of screed rails may be required to meet required surface tolerances.

.2 Move vibrating screed forward as rapidly as possible while allowing proper consolidation and finishing of the concrete surface. Extended use of a vibratory screed may result in segregation of the concrete producing excessive mortar at the surface which can result in a weak surface layer.

.3 Immediately after concrete has been placed and consolidated, bull-float slab surface to a smooth uniform surface.

.4 When the surface is sufficiently set to accommodate the weight of a person with only minor indentation of the surface, and all bleed water has evaporated, use one pass of a power float surface to smooth out the surface. A light hand trowel will then be necessary to smooth out irregularities and provide a hard, dense surface.

.5 Use of hand trowels will be required to hand finish areas the finishing machine cannot reach.

.6 Surface free of all trowel marks and ridges.

.7 Vertical Formed Surface

.1 Where applicable finishing of formed surfaces shall commence immediately after stripping the forms.

.2 All form ties and other metal items shall be removed or cut back to a depth of at least 20 mm from the surface of the concrete.

.3 Patch surface defects as directed by Contract Administrator.

.4 Unless otherwise indicated in the Schedule of Finishes all formed surfaces shall receive a smooth-form finish in accordance with CSA-A23.1.

.5 Vertical surfaces of curbs, walls, upstands, etc. shall receive a smooth-rubbed finish in accordance with CSA A23.1.

.6 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated.

.8 Schedule of finishes:

.1 Interior slabs unless noted:

.1 Two or more passes of the trowel shall be made at suitable time intervals to obtain a dense, hard, smooth surface, free from trowel marks.

.2 The specified finish shall be Class A as defined by CSA-A23.1 and meet the following requirements.

.1 Straightedge value: ±8 mm

.2 FF = 20

.3 FL = 15

.4 SWI = 4

.5 Surface texture: Steel trowel finish as per CSA-A23.1 Section 7.5.4.3.

.6 Surface free of all trowel marks and ridges.

.2 Concrete receiving topping:

.1 Once a uniform surface has been achieved, the surface shall be given a scratch finish with a stiff wire or bristle brush, or a broom. This shall produce closely spaced grooves approximately 5mm in depth.

.2 The specified finish shall be Class A as defined by CSA-A23.1 and meet the following requirements.

.1 Straightedge value: ±8 mm

.2 FF = 20

.3 FL = 15

.4 SWI = 4

.5 Surface texture: Scratch finish as per CSA-A23.1 Section 7.5.6.2.

.6 Surface free of all trowel marks and ridges.

.3 Concrete to receive cold-applied liquid membrane:

.1 Class A to CSA A23.1.

.2 Texture: surface to be free of all trowel marks and ridges.

3.6 JOINTS

.1 Install control joints at locations shown on the drawings. Joints shall correspond to location of slip dowels.

.2 Location of control and construction joints:

.1 Paving slabs: As shown on Drawings.

.2 Other flatwork including wearing slabs on insulation: not more than 15' on-centre and matching joints in adjacent Work.

.3 Control joints in upstand walls and curbs to be formed in at not more that 15' on-centre and matching joints in adjacent Work using a 1/2" x 1/2" form strip on each face. Tool in joints along top surface corresponding to form strips.

.3 Control joints and construction joints shall be formed or tooled at locations shown. Refer to Drawings for paving patterns and joint locations.

.1 All joints to be sawcut via specialized dry-process cutting.

.1 Sawcut to a minimum of one 1.5" or one-quarter of the depth of the slab, whichever is greater, following initial set of concrete.

.2 Timing of the saw cutting will vary with weather conditions however are typically completed within 1 to 4 hours after final finishing. Timing of the saw cutting will be the responsibility of the Contractor.Sawcutting 24 hours following placement will not be permitted.

.4 Where paving abuts curbs, walls and other vertical surfaces use 12 mm asphalt impregnated fibre board.

.5 Unless otherwise indicated, all control and construction joints to be filled with a flexible joint sealant.

3.7 CURING

.1 Cure and protect concrete in accordance with requirements CSA A23.1.

.2 Concrete surfaces to be cured at a minimum temperature of 10°C for the entire curing period.

.3 Curing methods shall be in accordance with Tables 2 and 20 of CSA A23.1 unless otherwise indicated.

.1 Basic curing methods for curing types 1 and 2 in table 20 of CSA A23.1 shall consist of one of the following:

.1 polyethylene sheet;

.2 forms in contact with concrete surface; or

.3 curing compounds to ASTM C309 at manufacturer's specified applications rates, when approved by Contract Administrator.

.2 Curing Type 3 in CSA A23.1 requires a wet cure for 7 days as follows:

.1 Immediately after final finishing, protect exposed surface against plastic shrinkage by means of a fog spray and/or evaporation reducer, until the concrete has enough strength to support the placement of the wetted burlap. When an evaporation reducer is used, intermittent reapplication may be required if the film evaporates before initiation of the wet cure.

.2 Burlap to be thoroughly presoaked by immersing it in water for a period of at least 24 hours immediately prior to placement.

.3 Commence wet curing with burlap and water as soon as the surface will support the weight of the wetted burlap without deformation. Burlap to

be applied in one layer with strips overlapping at least 75 mm and be securely held in place without marring the concrete surface.

.4 Wet curing with burlap and water must be maintained for the periods indicated. Periodic rewetting by means of a soaker hoses, sprinklers, or other suitable methods approved by the Contract Administrator may be necessary.

.4 Unless noted otherwise the curing regime shall be consistent with the Class of Exposure. See General Notes on structural drawing for Class of Exposure.

3.8 FIELD QUALITY CONTROL

.1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Contract Administrator in accordance with CSA-A23.1 and Section 01450 - Quality Control and as described herein.

.1 Testing laboratory to be certified in accordance with CSA A283.

.2 The Contractor will pay for costs of tests via the testing cash allowance as per Section 01 21 00 - Allowances.

.3 Frequency and Number of Tests:

.1 Not less than one strength test per 50 m^3 of concrete placed and not less than one test for each class of concrete placed on any one day.

.2 Slump and air measurements will be completed on each of the initial 3 loads of concrete per day of casting to ensure satisfactory control of the air content is established. If adequate control of air content is not established within the first 3 loads of concrete or if a test falls outside the specified limits, the testing frequency shall revert to one test per load until satisfactory control is re-established. Costs for additional testing will be the responsibility of the concrete supplier.

.4 Contract Administrator may take additional test cylinders during cold weather concreting or when concrete quality is suspect. Cure cylinders on job Site under same conditions as concrete which they represent.

.5 Non-destructive Methods for Testing Concrete shall be in accordance with CSA-A23.2.

.6 Inspection or testing by Contract Administrator will not augment or replace Contractor quality control nor relieve contractual responsibility.

3.9 DEFECTIVE CONCRETE

.1 Defective concrete: cracking, spalling, scaling and concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.

.2 Repair or replacement of defective concrete will be determined by the Contract Administrator, based on the specifications and the above guidelines.

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

.4 Modify or replace concrete not conforming to lines, detail and elevations indicated on drawings.

.5 Repair or replace concrete not properly placed, resulting in excessive honeycombing and other defects in critical areas of stress.

.6 Notify Contract Administrator of proposed methods of repairing or replacing defective concrete. Methods of repairing or replacing defective concrete shall be acceptable to the Contract Administrator.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 04 05 12 – Masonry Mortar and Grout
.2 Section 04 05 19 – Masonry Anchorage and Reinforcing
.3 Section 04 22 00 – Concrete Unit 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 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, limitations and colours.

.3 Samples:

.1 Provide samples as follows:

.1 Two of each type of masonry unit specified, including special shapes, supplemented with specific requirements in Section 04 22 00 – Concrete Unit Masonry.
.2 Two cured, coloured samples of mortar, illustrating mortar colour and colour range, supplemented with specific requirements in Section 04 05 12 - Masonry Mortar and Grout.
.3 Two of each type of masonry accessory and flashing specified, supplemented by specific requirements in Section 04 05 23 - Masonry Accessories.
.4 One of each type of masonry anchorage, reinforcement and connector proposed for use, supplemented by specific requirements in Section 04 05 19 - Masonry Anchorage and Reinforcing.
.5 Submit samples for testing to laboratories employing technicians certified / trained in procedures for testing masonry units.

.4 Informational Submittals

.1 Submit manufacturer’s installation instructions.
.2 Test reports and product certificates.

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 with specification requirements.

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

1.5 QUALITY ASSURANCE

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver materials to job Site in dry conditions.

.3 Storage and Handling Protection:

.1 Keep materials dry until use.

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

1.7 SITE CONDITIONS

.1 Ambient Conditions: assemble and erect components when temperatures are above 4 degrees C.

.2 Weather Requirements: to CSA-A371.

.3 Cold weather requirements:

.1 To CSA-A371 with following requirements.

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

.2 Maintain ambient temperature of masonry Work and it's constituent materials between 5 degrees C and 50 degrees C and protect Site from windchill.

.3 Maintain temperature of masonry above 0 degrees C for minimum of 7 days, after mortar is installed.

.4 Preheat unheated wall sections in enclosure for minimum 72 hours above 10 degrees C, before applying mortar.

.4 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.

.3 Spray mortar surface at intervals and keep moist for maximum of three days after installation.

Part 2 Products

2.1 MATERIALS

.1 Masonry materials are specified elsewhere in related Sections

Part 3 Execution

3.1 INSTALLERS

.1 Experienced and qualified masons to carry out erection, assembly and installation of masonry Work.

3.2 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.

3.3 EXAMINATION

.1 Examine conditions, substrates and Work to receive Work of this Section.

.2 Examine openings to receive masonry units. Verify opening size, location, and that opening is square and plumb, and ready to receive Work of this Section.

.3 Verification of Conditions:

.1 Verify that:

.1 Substrate conditions which have been previously installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of masonry.

.2 Field conditions are acceptable and are ready to receive Work.

.3 Built-in items are in proper location, and ready for roughing into masonry Work.

3.4 PREPARATION

.1 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations.

.2 Establish and protect lines, levels, and coursing.

.3 Protect adjacent materials from damage and disfiguration.

.4 Provide temporary bracing of masonry Work during and after erection until permanent lateral support is in place.

3.5 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, respecting construction tolerances permitted by CSA-A371.

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

3.6 CONSTRUCTION

.1 Exposed masonry:

.1 Remove chipped, cracked, and otherwise damaged units, in accordance with CSA A-165, 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.

.2 Allow joints to set just enough to remove excess water, then rake joints uniformly to 6 mm 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 Build in items required to be built into masonry.

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

.3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.

.5 Wetting of bricks:

.1 Except in cold weather, wet bricks having 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 Support of loads:

.1 Use 20 MPa concrete to Section 03 30 00 - Cast-in-Place Concrete, where concrete fill is used in lieu of solid units unless noted on drawings.

.2 Install building paper below voids to be filled with concrete; keep paper 25 mm back from faces of units.

.7 Provision for movement:

.1 Leave 3 to 6 mm space below shelf angles.

.2 Leave 20 mm space between top of non-load bearing walls and partitions and structural elements. Do not use wedges.

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

.8 Loose steel lintels:

.1 Install loose steel lintels. Centre over opening width.

.9 Control joints:

.1 Construct continuous control joints as indicated.

.10 Expansion joints:

.1 Build-in continuous expansion joints as indicated.

.11 Interface with other Work:

.1 Cut openings in existing Work as indicated.

.2 Openings in walls: approved by Contract Administractor.

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

3.7 SITE TOLERANCES

.1 Tolerances in notes to CSA-A371 apply.

3.8 FIELD QUALITY CONTROL

.1 Inspection and Testing will be carried out by Testing Laboratory designated by Contract Administractor.

.2 Notify inspection agency minimum of 24 hours in advance of requirement for tests.

3.9 CLEANING

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

.2 Upon completion of installation and verification of performance of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.10 PROTECTION

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

.2 Temporary Bracing:

.1 Provide temporary bracing of masonry Work during and after erection until permanent lateral support is in place.

.2 Brace masonry walls as necessary to resist wind pressure and lateral forces during construction.

.3 Moisture Protection:

.1 Keep masonry dry using waterproof, nonstaining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until completed and protected by flashing or other permanent construction.

.2 Cover completed and partially completed Work not enclosed or sheltered with waterproof covering at end of each Work day. Anchor securely in position.

.3 Air Temperature Protection: protect completed masonry as recommended in 1.7 SITE CONDITIONS.

END OF SECTION

Part 1 General

1.1 APPLICATION

.1 This Section applies to the construction of new masonry elements on this project. For repairs and repointing of existing masonry refer to 04 11 50 – Mortar for Historic Masonry.

1.2 RELATED REQUIREMENTS

.1 Section 04 05 00 – Common Work Results for Masonry
.2 Section 04 05 19 – Masonry Anchorage and Reinforcing
.3 Section 04 05 23 – Masonry Accessories
.4 Section 04 22 00 – Concrete Unit Masonry

1.3 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 and Standard Practices for Concrete.

.2 CAN/CSA A179-04, Mortar and Grout for Unit Masonry.

.3 CAN/CSA A371-04, Masonry Construction for Buildings.

.4 CAN/CSA-A3000-03, Cementitious Materials Compendium; CAN/CSA-A3002-[03], Masonry and Mortar Cement.

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 23 – Shop Drawings, Product Data, and Samples.

.2 Product Data:

.1 Provide manufacturer's printed product literature, specifications and datasheets.

.3 Samples: Provide duplicate smaples of specified coloured grout.

.4 Informational Submittals:

.1 Submit two copies of WHMIS MSDS – Material Safety Data Sheets. Indicate VOC’s mortar, grout and admixtures.

.2 Submit manufactuer’s installation instructions.

.3 Product certificates.

.4 Test reports.

1.5 QUALITY ASSURANCE

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

.1 Submit laboratory test reports.

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

Part 2 Products

2.1 MATERIALS

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

.2 Cement:

- .1 Portland Cement: to CAN/CSA-A3000.
- .2 Masonry Cement: to CAN/CSA-A3002 and CAN/CSA A179.
- .3 Mortar Cement: to CAN/CSA-A3002 and CAN/CSA A179.
- .4 Packaged Dry Combined Materials for mortar: to CAN/CSA A179.

.3 Aggregate: supplied by one supplier. To CAN/CSA A179.

.4 Water: clean and potable.

.5 Lime: To CAN/CSA A179.

.6 Mortar:

- .1 To CSA A179.
- .2 Use aggregate passing 1.18mm sieve where 6mm thick joints are indicated.
- .3 White mortar: use white Portland cement, and white masonry cement to produce mortar type specified.
- .4 Colour: ground coloured natural aggregates or metallic oxide pigments, use colouring admixture not exceeding 10% of cement content by mass, or integrally coloured masonry cement, to produce coloured mortar to match approved sample.
- .5 Non-staining mortar: use non-staining masonry cement for cementitious portion of specified mortar type.
- .6 Mortar type:
  - .1 Exterior , parapet, and Loadbearing Walls: type S mortar having a minimum strength of 12 MPa at 28 days.
  - .2 Non-Loadbearing Walls: type N mortar having a compressive strength of 5 MPa at 28 days. proportion specifications.
- .7 Colour mortars:
  - .1 Incorporate colour and admixtures into mixes in accordance with manufacturer's instructions.
  - .2 Use clean mixer for coloured mortar.
- .8 Pointing Mortar:
  - .1 Prehydrate 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 a 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.

.7 Grout:

.1 To CSA A179.

.2 Mix grout to semi-fluid consistency.

.3 Do not use calcium chloride or chloride based admixtures.

2.2 SOURCE QUALITY CONTROL

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

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 CAN/CSA A179 except where specified otherwise.

3.3 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 04 05 00 – Common Work Results for Masonry
.2 Section 04 05 12 – Masonry Mortar and Grout
.3 Section 04 22 00 – Concrete Unit 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 and Standard Practices for Concrete.
.2 CAN/CSA A179-04, Mortar and Grout for Unit Masonry.
.3 CAN/CSA A370-04, Connectors for Masonry.
.4 CAN/CSA A371-04, Masonry Construction for Buildings.
.5 CAN/CSA G30.18-M92(R2007), Billet-Steel Bars for Concrete Reinforcement.
.6 CSA-S304.1-04, Design of Masonry Structures.
.7 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.3 SUBMITTALS

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

.2 Product Data:

.1 Provide manufacturer's printed product literature, specifications and datasheets.

.3 Shop Drawings:

.1 Shop Drawings shall consist of bar bending details, lists and placing drawings.
.2 On placing drawings, indicate sizes, spacing, location, and quantities of reinforcement and connectors.

.4 Informational Submittals:

.1 Provide 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.

Part 2 Products

2.1 MATERIALS

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

.2 Connectors: to CAN/CSA A370 and CSA-S304.1.

.3 Corrosion protection:

- .1 To CSA-S304.1.
- .2 In contact with tyndall stone: all connectors shall be stainless steel.
- .3 In contact with brick: all connectors shall be hot-dipped galvanized.

.4 Masonry ties and connectors:

- .1 To CSA – A370 and CSA-S304. Adjustable anchors that allow vertical adjustment but resist tension and compression forces perpendicular to place of wall.
- .2 At CMU substrates with solid brickVeneer:
  - .1 Components:
    - .1 Connector Plate: 1.6mm thick by length to suite CMU width and thickness of air/vapour barrier membrane, insulation, and air space; hot dipped galvanized.
    - .2 V-Tie: V-shape wire tie, 4.8mm diameter bylength to provide placement of V-tie legs at centreline of solid unit veneer; hot dipped galvanized.
    - .3 Insulation Support: polyethylene, friction fit, used to ssecure insulation in place.
  - .2 Acceptable products: Fero Corporation “Block Shear Connector.”
- .3 At stud framing backup walls:
  - .1 Components:
    - .1 Connector plate: 1.6mm thick by length equal to full width of stud plus thickness of sheathing, insulation and air space; hot dipped galvanized.
    - .2 V-tie: V-shape wire tie, 4.8mm dia by length to provide placement of V-tie legs at centreline of solid unit veneer; hot dipped galvanized.
    - .3 Fasteners for steel studs: corrosion-resistance, self-tapping sheet metal screws, length to penetrate 19mm beyond stud face.
    - .4 Insulating strips: close cell polyethylene foam strips, 3mm thick. Same size as connector plate in contact with stud.
    - .5 Insulation Support: polyethylene, friction fit, used to secure insulation in place.
  - .2 Acceptable Products: Fero Corporation “Side Mounting Rap-Tie System.”
- .4 At Cast-in-Place Concrete Substrates with Solid Brick Veneer:
  - .1 Components:

.1 Connector Plate: L-shape, vertically oriented plate, 1.6mm thick by length to suit thickness of air/vapour barrier membrane, insulation, and air space, hot dipped galvanized.

.2 V-tie: V-shape wire tie, 4.8mm dia by length to provide placement of V-tie legs at centreline of solid unit veneer; hot dipped galvanized.

.3 Insulation Support: polyethylene, friction fit, used to secure insulation in place.

.2 Acceptable products: Fero Corporation "Rap-tie Connector."

.5 Single Wythe Joint Reinforcement: ladder type:

.1 Cold drawn steel wire conforming to ASTM A82.

.2 Standard Joint Reinforcement consisting of 3.66mm (9ga) longitudinal wires and 3.66mm cross or diagonal wires.

.3 Yield Strength is 480MPa.

.6 Anchors: to CAN/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 Canada.

.2 Fabricate connectors in accordance with CAN/CSA A370.

.3 Obtain Contract Administrator's approval for locations of reinforcement splices other than shown on placing drawings.

.4 Upon approval of Contract Administrator, 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 Contract Administrator with certified copy of mill test report of reinforcement steel, showing physical and chemical analysis, minimum 4 weeks prior to commencing reinforcement Work.

.2 Upon request inform Contract Administrator of proposed source of material to be supplied.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 GENERAL

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

.2 Prior to placing concrete, obtain Contract Administrator's approval of placement of reinforcement.

3.3 TIES AND CONNECTORS

.1 Tie masonry veneer to backing in accordance with NBC, CSA-S304.1, CAN/CSA A371 and as indicated.

.2 Exterior masonry veneer on concrete block backup walls:

.1 Spacing: 600mm on centre vertical intervals. 400mm on centre horizontal intervals.

.2 Set connector plates in mortar joists of backup walls, in accordance with manufactuer's instructions.

.3 Coordinate spacing with cavity wall insulation to ensure connector plates are centred on horizontal joints of insulation boards.

.4 Install insulation support over each connector plate to hold insulation tight to backup walls.

.5 Insert wire tie into connector plate and embed into mortar joints of masonry veneer. Ensure wire tie is aligned and level with horizontal joints of masonry veneer.

.3 Exterior masonry veneer on stud framing backup walls.

.1 Spacing: 600mm on centre vertical intervals. 400mm on centre horizontal intervals.

.2 Install connector plates on studs with two screw fastener / plate. Ensure screws are tight and secure. Remove and replace stripped or loose fasteners.

.3 Coordinate spacing with cavity wall insulation to ensure connector plates are centred on horizontal joints of insulation boards.

.4 Install insulating strip between each connector plate and stud face.

.5 Install insulation support over each connector plate to hold insulation tight to backup walls.

.6 Insert wire tie into connector plate and embed into mortar joints of masonry veneer. Ensure wire tie is aligned and level with horizontal joints of masonry veneer.

.4 Cast-in-place concrete back-up:

.1 Fasten ties to CIP concrete back-up with metal fasteners of type indicated. Use two fasteners per location.

3.4 LADDER REINFORCING

.1 Install in accordance with CAN/CSA A370 and CAN/CSA A371.

.2 Install horizontal joint reinforcement every second course. Every course for stack bond.

.3 Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 400 mm each side of opening.

.4 Place joint reinforcement continuous in first joint below top of walls.

.5 Lap joint reinforcement ends minimum 150 mm.

.6 Connect stack bonded unit joint corners and intersections with strap anchors 200 mm on centre.

3.5 REINFORCED LINTELS AND BOND BEAMS

.1 Reinforce masonry beams, masonry lintels and bond beams as indicated.

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

.3 Support and position reinforcing bars in accordance with CAN/CSA A371.

3.6 GROUTING

.1 Grout masonry in accordance with CSA-S304.1, CAN/CSA A371 and CAN/CSA A179 and 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.

3.8 MOVEMENT JOINTS

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

3.9 FIELD BENDING

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

.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.

3.10 FIELD TOUCH-UP

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

3.11 CLEANING

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

END OF SECTION

Part 1 GENERAL

This section details the mortar requirements for the repointing of existing brick masonry on this project. The Work is to be included in the Contractor's Bid and will not be quantified for the purposes of payment. Identification of the areas of repair are to be established by the Contractor but under the direction of the Contract Administrator with respect to the criteria for repair. The primary purpose of the repointing is to restore the structural integrity of the building walls. The use of bonding agents is prohibited unless authorized in writing by the Contract Administrator. All sealant on or in existing stone joint is to be completely removed and joints to be pointed with mortar.

1.1 RELATED SECTIONS

.1 Section 04 40 10: Masonry Repairs

1.2 REFERENCES

.1 ASTM C5-79-1988 Specification for Quicklime for Structural purposes.

.2 ASTM C207-79-1988 Specification for Hydrated Lime for Masonry.

.3 CAN/CSA-A5-M88 Portland Cement.

.4 CAN/CSA-A8-M88 Masonry Cement.

.5 CSA A82.56-1950, R1971 Aggregate for Masonry Mortar and ASTM C144.

.6 CSA A179-M1994 Mortar and Grout for Unit Masonry.

1.3 COMPRESSIVE STRENGTH AND TOLERANCES

.1 Brick Mortar

.1 Mortar compression strength when tested using 50 mm mortar cubes in accordance with CSA standard A179M shall be a minimum 3.5 MPa, cured for 28 days. The designated mortar shall be Type N. The air content shall be between 7% and 14%.

.2 If the mortar fails to meet the 7 day compressive strength requirements, but meets the 28 day compressive strength requirement it is to be accepted. If the mortar fails to meet the 7 day compressive strength requirement, but its strength at 7 days exceeds two thirds of the value required for the 7 day strength, the contractor may elect to continue Work at their own risk while awaiting the results of the 28 day tests, or to take down the Work affected.

1.4 SAMPLES

.1 Prepare a mock-up of the mortar joint pointing and patching Work in areas agreed upon on Site with the Contract Administrator. Mock-up acceptability will be based on visual compatibility with existing mortar and stone and conformance to specified strength

requirements. The Contractor will not be permitted to proceed until approval of the mock-up has been received.

.3 Samples of the mortar and patching material used for the mock-up area will be submitted for the compressive strength testing. The Contractor will be required to subcontract a CSA certified testing agency to obtain samples and complete a compressive strength testing in accordance with CSA requirements. Costs for mortar testing to be submitted under the Testing Cash Allowance.

.4 The approved mock-up, mortar mix, and the methods and procedures used to achieve the mock-up will establish a minimum acceptable standard for remaining Work based on the Contract Administrator's Site review and receipt of the compressive strength test results. Work will not proceed on other areas before the mock-up is approved.

1.5 TEST REPORTS

.1 Submit two (2) sets of test results to show that properties are appropriate to each particular mortar mix.

1.6 EXISTING CONDITIONS

.1 Investigate possible structural problems and report before beginning masonry Work. Contract Administrator will provide ongoing direction with respect to necessity of the type of repair.

.2 In general, mortar joints will require repointing when:

I) **Open Joints:** the mortar is deeply eroded (more than one half inch from the face of the masonry), or the mortar has fallen out, or,

II) **Cracked Joints:** cracks, hairline width or larger, have formed in the mortar, or,

III) **Separated Joints:** the mortar and masonry no longer adhere, resulting in a gap or crack between the two, or the mortar is sitting loosely in the joint, or,

IV) **Unsound Joints:** joint is found to contain voids or weak areas as revealed by hammer-sounding or other approved method.

V) **Caulked Joints:** Sealant has been applied on or in the mortar joint. All caulking must be completely removed and joint cleaned for mortar application.

.3 Study the existing pointing styles and methods of reproducing them. Style of joint will be reviewed in the mock-up.

.4 Examine horizontal and vertical joints to determine which were struck first and whether they are same style, as well as other respects of Workmanship which establish authenticity of original Work.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Execute Work when ambient temperature is above 4º C. When ambient temperature is below 4º C, cease Work unless provisions are in place to protect mortar from freezing.

.2 Prepare and maintain temperature of mortar between 5º C and 30º C until used.

1.8 SCHEDULING OF WORK

.1 Submit Work schedule indicating anticipated progress stages within time of final completion shown in bid document.

.2 Take measures necessary to complete Work within approved schedule time. Schedule may not be changed without approval.

1.9 ALTERNATIVES

.1 Obtain the Contract Administrator's approval before changing manufacturer's brands or sources of supply of mortar materials during entire contract or other methods of mixing mortar specified elsewhere in this specification.

Part 2 Products

2.1 STONE JOINT MORTAR

.1 Materials

- .1 Sand: to CSA A82.56. Passing 1.18 mm for stone mortar.
- .2 Water shall be potable, clean and free of deleterious amounts of acids, alkalies, or organic materials.
- .3 Lime:
  - .1 Processed Lime (Quicklime): to ASTM C5 and CSA A82.43M.
  - .2 Hydrated Lime: ASTM C207 and A82.43M.
- .4 Portland Cement: CAN/CSA-A5.
  - .5 Masonry Cement: CAN/CSA-A8.
- .6 White Cement (If Required): use white silica sand and white Portland Cement and lime.
- .7 Colour: ground coloured natural aggregates to match the existing. If a pigment is required, ensure that only chemically pure synthetic oxide pigments are utilized and are alkali proof and sun fast. Do not use organic dyes.
- .8 Calcium chloride shall not be used for any purpose or in any instance.
- .9 Air entrainment: factory processed lime (Type 2A) with agents for air entrainment shall be used on exterior mortar mixes at dosages recommended by the manufacturer.

.2 Proportions

.1 Exact ratio of lime and sand specified in 2.2.1 varies according to properties of material sources, and to properties of historic lime mortars. Use of a mixture which has lower ultimate compression strength than masonry unit is required.
.2 Starting point for development of mortar by volume:

.1 Brick masonry mortar shall be Type N, as defined by CSA A179 (latest). Suggesting mortar constituent starting point shall be:

Portland Cement:	1 part
Lime:	1 parts
Sand:	4.5 to 6 parts

.2 Air content of exterior mortar mixes shall not exceed 14% by volume but at no time be less than 7%.

.3 Mortar

.1 Masonry mortar mixed in proportion with enough water to make as stiff as can be Worked.
.2 Repointing: new mortar to be used in repointing is to match the existing mortar as specified in paragraph 2.2.
.3 Time limit: discard mix not used and placed within 2 hours.
.4 Allow mortar to set before subjecting to load.
.5 Colouring material agent: colour pigments comprising of metallic oxide composition shall not exceed 10% of weight of binder materials. Carbon black not to exceed 3.0% of weight of binder materials.
.6 Do not use admixtures or anti-freeze components in mortar unless authorized in writing by the Contract Administrator.

.4 Coloured Lime Mortar

.1 Use sand as colouring agent.
.2 Maintain one mortar mixer exclusively for coloured mortar for each type of stone.

Part 3 Execution

3.1 BRICK MASONRY JOINT MORTAR

.1 Preparation

.1 Soak processed lime in water for not less than 24 hours or soak hydrated lime in water for not less than 12 hours.
.2 Place safety devices and signs near the Work.

.2 Mixing

.1 Mix all dry ingredients before adding any water to obtain even colour and remove lumps.

.2 Add one half cup water and mix for about 5 minutes. The remaining water should then be added in small portions until the desired consistency is reached. In general, the desired mortar consistency uses the minimum amount of water to allow the mortar to stick to a trowel held upside down.

.3 Retempering or addition more water after the initial mix is prepared is not permitted. Allow mortar to age approximately ½ hour prior to application to reduce shrinkage.

.4 Mix mortar ingredients in quantities for use in 2 hours.

.5 Use manual mixing as long as quantities of materials and water are accurately controlled and the method of mixing is approved by the Contract Administrator.

.6 Add water slowly while mixing until all lumps are eliminated.

.3 Field Quality

.1 Follow proper batching procedure.

.2 Use batching box.

.3 Monitor mixing time.

.4 The Contractor shall retain a CSA certified testing agency to complete the pre-qualification strength testing on mortar samples prepared by the contractor for approval. In addition, the Contractor shall retain the CSA certified testing agency to obtain mortar samples from the Contractor's Working mix in accordance with CSA standards.

.5 Costs for testing shall be carried by the The City with test reports provided to the Contractor and Contract Administrator.

.4 Cleaning

.1 Remove droppings and splashes using clean sponge and water.

.2 Clean masonry with clean water and soft natural bristle brush.

.5 Protection of Completed Work

.1 Cover completed and partially completed Work not enclosed or sheltered with waterproof covering at end of day Work day. Anchor securely in position.

.2 Provide if necessary, temporary bracing, and scaffolding as required.

.6 Cleaning

.1 Uncured mortar should be removed immediately with clean water and a rubber sponge.

.2 Cured mortar may only be removed chemically or mechanically.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 04 05 00 – Common Work Results for Masonry
.2 Section 04 05 12 – Masonry Mortar and Grout
.3 Section 04 05 19 – Masonry Anchorage and Reinforcing

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CAN/CSA-A165 Series-2004, CSA Standards on Concrete Masonry Units.
.2 CAN/CSA A371-04, Masonry Construction for Buildings.
.3 CSA S304.1-04, Design of Masonry Structures.

1.3 SUBMITTALS

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

Product Data: provide product data, including manufacturer's printed data sheets.

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 with specification requirements.

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

Part 2 Products

2.1 MATERIALS

.1 Standard concrete block units: to CAN/CSA-A165 Series (CAN/CSA-A165.1) .

.1 Classification: H/15/A/M.
.2 Size: Modular – Mason to confirm whether existing block is imperial or metric prior to ordering block.
.3 Special shapes: provide square units for exposed corners. Provide purpose-made shapes for lintels, beams and bond beams. Provide additional special shapes as indicated.

2.2 TOLERANCES

.1 Tolerances for standard concrete unit masonry tolerances in accordance with CAN/CSA A165.1, supplemented as follows:

.1 Maximum variation between units within specific job lot not to exceed 2 mm.

.2 No parallel edge length, width or height dimension for individual unit to differ by more than 2 mm.

.3 Out of square tolerance not to exceed 2 mm.

.2 Tolerances for architectural concrete masonry units in accordance with CAN/CSA A165.1, supplemented as follows:

.1 Maximum variation in length or height between units within specific job lot for specified dimension not to exceed 2 mm.

.2 No parallel edge length, width or height dimension for individual unit to differ by more than 2 mm.

.3 Out of square tolerance not to exceed 2 mm.

.4 Maximum variation in width between units within specific job lot for specified dimension not to exceed 2 mm.

Part 3 Execution

3.1 EXAMINATION

.1 Verify surfaces and conditions are ready to accept Work of this Section.

.2 Commencing installation means acceptance of existing substrates.

3.2 PREPARATION

.1 Protect adjacent finished materials from damage due to masonry Work.

3.3 INSTALLATION

.1 Concrete block units:

.1 Bond: running unless noted.

.2 Coursing height: 200 mm for one block and one joint.

.3 Jointing:

.1 Concave where exposed or where paint or other finish coating is specified.

.2 Raked for specialty concrete masonry units.

.3 Flush joints: where concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating, and to height to suit resilient base where resilient base is applied to painted walls.

.4 Extend architectural concrete masonry units to one course above ceilings. Where partitions extend to underside of structure use standard CMU for portion of partitions above ceiling.

.2 Special Shapes:

.1 Install special units to form corners, returns, offsets, reveals and indents without cut ends being exposed and without losing bond or module.

.2 Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated.

.3 End bearing: not less than 200 mm unless noted on drawings.

3.4 REINFORCEMENT

.1 Install reinforcing in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

3.5 CONNECTORS

.1 Install connectors in accordance with Section 04 05 19 - Masonry Anchorage and Reinforcing.

3.6 FLASHING

.1 Install flashings: in accordance with Section 04 05 23 - Masonry Accessories.

3.7 MORTAR PLACEMENT

.1 Place mortar in accordance with Section 04 05 12 - Masonry Mortar and Grout.

3.8 CONSTRUCTION

.1 Cull out masonry units, in accordance with CAN/CSA A165 and reviewed range of colour samples, with chips, cracks, broken corners, excessive colour and texture variation.

.2 Build in miscellaneous items such as bearing plates, steel angles, bolts, anchors, inserts, sleeves and conduits.

.3 Build around frames previously set and braced. Fill behind hollow frames within masonry walls with mortar or grout and embed anchors.

.4 Fit masonry closely against electrical and plumbing outlets so collars, plates and covers overlap and conceal cuts.

.5 Install movement joints and keep free of mortar where indicated.

.6 Hollow Units: spread mortar setting bed from outside edge of face shells. Gauge amount of mortar on top and end of unit to create full joints, equivalent to shell thickness. Avoid excess mortar.

.7 Solid Units: apply mortar over entire vertical and horizontal surfaces. Avoid bridging of airspace between brick veneer and backup wall with mortar.

.8 Ensure compacted head joints. Use full or face-shell joint as indicated.

.9 Tamp units firmly into place.

.10 Do not adjust masonry units after mortar has set. Where resetting of masonry is required, remove, clean and reset units in new mortar.

.11 After mortar has achieved initial set up, tool joints.

.12 Do not interrupt bond below or above openings.

3.9 REPAIR/RESTORATION

.1 Upon completion of masonry, fill holes and cracks, remove loose mortar and repair defective Work.

3.10 CLEANING

.1 Standard Block: Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block. Clean wall surface with suitable brush or burlap.

.2 Unglazed clay masonry: Sample clean inconspicuous area, designated by Contract Administrator. 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 1L 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.

END OF SECTION

Part 1 General

Select areas of the existing brick masonry show signs of distress, including cracking and displacement, both in the brick and the mortar. This section details the types of repairs to be utilized to address these areas of distress.

This Section also applies to existing voids to receive new brick masonry as required.

Identification of the areas of repair are to be established by the Contractor but under the direction of the Contract Administrator with respect to the criteria for repair.

The Work of **Method A -** Mortar Joint Repointing and **Method B -** Rebuild Localized Areas of Brick Masonry are included under the Fixed Price. All repointing and rebuilding Work, to all areas, as required by the outlined criteria, will be included in the indicated Fixed Price. Access to all brick areas will be included in the indicated Fixed Price.

1.1 REPAIR METHODS

.1 **Method A**: Mortar Joint Repointing:

Repoint existing brick masonry joints throughout all four interior faces of the building from the elevation of ceiling framing up to the top of the parapet. Work must include the removal of all caulking applied over the joints followed by installation of the specified joint mortar.

a) Visually inspecting for obvious signs of deteriorated masonry;
b) Testing of joints, not visually unsound, to identify unsound joints, and
c) Raking and repointing unsound joints.

.2 **Method B:** Rebuild localized areas of brick masonry

Part 2 Products

2.1 MATERIALS

.1 Mortar materials: to Section 04 11 50 – Masonry Mortar.

.2 Stone anchors for stone stabilization to be Hilti HY20 Type 304 stainless steel anchors c/w stainless steel sieve.

Part 3 Execution

3.1 GENERAL

.1 Perform Work in accordance with CAN3-A371 (latest).

.2 Use manual raking tools to remove deteriorated mortar from masonry joints. Do not use power tools unless authorized by Contract Administrator.

.3 Tool and compact using jointing tool to force mortar into joint.

.4 Finish joints to match existing joints, except where specified otherwise.

.5 Use suitable approved jointing tool to form compacted slightly concave tooled joints on exterior joints.

.6 Use calking gun to inject mortar for fine gauged masonry areas where mortar joints are too narrow for tool penetration.

.7 Comply with manufacturer's written specifications and recommendations for surface preparation, mixing, application, and curing of mortars.

.8 When temperature is 4°C or less, suspend Work until temperature is anticipated to remain above 4°C, unless provisions are in place to protect the mortar from freezing.

3.2 METHOD A: MORTAR JOINT REPOINTING

.1 Repoint existing brick masonry joints throughout all four interior faces of the building from the elevation of ceiling framing up to the top of the parapet. Work must include the removal of all caulking applied over the joints followed by installation of the specified joint mortar.

.2 Procedure of testing: inspect joints visually for obvious signs of deteriorated masonry. As a general rule, mortar may be satisfactory if the pointing is firm, intact and not eroded more than ½" from the face of the masonry. To judge which joints may need repointing, use the following criteria:

I) **Open Joints:** the mortar is deeply eroded (more than one half inch from the face of the masonry), or the mortar has fallen out, or,

II) **Cracked Joints:** cracks, hairline width or larger, have formed in the mortar, or,

III) **Separated Joints:** the mortar and masonry no longer adhere, resulting in a gap or crack between the two, or the mortar is sitting loosely in the joint, or,

IV) **Unsound Joints:** joint is found to contain voids or weak areas as revealed by hammer-sounding, by raking with an appropriate tool or other approved method to determine score resistance, surface unsoundness or delamination.

.3 Raking joints:

.1 Rake unsound joints free of deteriorated and loose mortar, dirt and other undesirable material. Joints should be raked to a minimum depth of 2 to 2.5 times the vertical joint height, but at no point less than 1".

.2 Clean out voids and cavities encountered during raking. Remove mortar cleanly from masonry, leaving square corners and a flat surface at back of cut.

.3 Clean by compressed air, surfaces of joints without damaging texture of exposed joints.

.4 Flush open joints and voids; clean with low pressure water and if not free draining blow clean with compressed air.

.5 Leave no standing water.

.6 Before filling joints, any masonry that is loose should be reset. Any pieces that are chipped off while removing old mortar shall be repaired at the contractor's cost.

.4 Repointing

.1 Masonry to be repointed shall be damp but not wet. Do not allow free standing water.
.2 Mortar joints are to be filled in successive layers. Deeper joints shall be filled first compacting new mortar in several layers until back of joint is flat. Several layers (maximum ½" each) will be needed to fill the joint flush with the surface of the masonry. Allow each layer to reach thumbprint hardness before the next is applied.
.3 Keep masonry damp while pointing is being performed.
.4 Do no pointing in freezing weather unless provisions are in place to protect mortar.

.5 Replacement

.1 Clean units by washing with water and natural fibre brush before laying.
.2 Dampen surfaces and apply mortar.
.3 Lay unit after mortar in courses below has hardened sufficiently to support weight.
.4 Set unit on water soaked softwood wedges to support it in proper alignment until mortar has set. Remove wedges when dry, do not break off.
.5 Remove mortar dropping from face of stone before mortar is set. Sponge stone free of mortar along joints as Work progresses.

.6 Tooling

.1 Do not finish joint by using trowel to smooth out mortar.
.2 Finish joint with slicker narrow enough to be placed inside the joint. Pull the slicker across surface of mortar to compress it.
.3 Proper timing of the tooling operation is essential. If mortar is tooled when it is too soft, the colour will be too light and hairline cracks may occur; if mortar is too hard, dark streaks may result and good closure between mortar and stone may be difficult to achieve.
.4 Do not feather edge mortar. Joints shall be finished with a slight concave joint profile unless noted otherwise.

.7 Mock-ups

.1 Provide mock-ups in accordance with 01 45 00 Quality control.

.2 Repointing mock-ups are required at the following locations:

.1 Brick repointing: provide mock-up size of 10 square feet. Allow to stand minimum 7 days prior to continuing repointing Work to allow assessment of colour change for cured mortar.

3.3 METHOD B: REBUILD LOCALIZED AREAS OF BRICK MASONRY

.1 For extent identified on drawings and determined by on-Site review with Engineer, rebuild localized areas of brick masonry.

.2 Rebuild wall to infill voids left after removing existing roof framing members.

.3 Where existing brick is in poor condition or has been previously dislodged from the wall, the Contractor is to provide suitable replacement brick salvaged from another source off-Site.

.4 Provide samples of replacement brick units in accordance with 01 33 00 Submittals.

4.0 FIXED/UNIT PRICE

4.1 **Method A: Mortar Joint Repointing** The Contractor shall provide a fixed price to repoint all of the stone mortar joints throughout areas of the building identified. The fixed price is to include all labour, materials, access and supervision required to complete the Work as described in the specifications and drawings.

4.2 **Method B: Rebuild Localized Area of Brick Masonry** The Contractor shall provide a fixed price to install brick units as directed by the Contract Administrator and as described herein. The fixed price Work shall be completed at areas identified on the drawings and on-Site by the Contract Administrator and shall include all labour, material, access, equipment, supervision and incidentals.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 05 21 00 – Steel Joist Framing.

.2 Section 05 31 00 – Steel Decking.

1.2 REFERENCES

.1 ASTM International Inc.

.1 ASTM A36/A36M-08, Standard Specification for Carbon Structural Steel.

.2 ASTM A193/A193M-08, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications.

.3 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.4 ASTM A325-07a, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

.5 ASTM A325M-08, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric).

.6 ASTM A490M-04ae, Standard Specification for High-Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-85.10-99, Protective Coatings for Metals.

.3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA)

.1 CISC/CPMA 2-75, Quick-Drying, Primer for Use on Structural Steel.

.2 CISC/CPMA 1-73a, Quick-Drying, One-Coat Paint for Use on Structural Steel.

.4 Canadian Standards Association (CSA International)

.1 CSA G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA-S16-01(R2007), Limit States Design of Steel Structures.

.4 CAN/CSA-S136-07, North American Specifications for the Design of Cold Formed Steel Structural Members.

.5 CSA W47.1-03, Certification of Companies for Fusion Welding of Steel.

.6 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.

.7 CSA W55.3-1965(R2003), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.8 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

.5 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International

.1 SSPC SP-2, SP-7.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Shop Drawings:

.1 Provide drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.

.3 Erection drawings:

.1 Submit erection drawings indicating details and information necessary for assembly and erection purposes including:

.1 Description of methods.

.2 Sequence of erection.

.3 Type of equipment used in erection.

.4 Temporary bracings.

.4 Fabrication drawings:

.1 Submit fabrication drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the Province of Manitoba, Canada.

.5 Samples :

.1 Upon request, prepare sample of typical exposed structural connections in accordance with AISC Specifications of Architecturally exposed structural steel for approval of Contract Administrator. Samples to be judged upon alignment of surfaces, uniform contact between surfaces, smoothness and uniformity of finished welds. When approved, sample units will serve as a standard for Workmanship, appearance and material acceptable for entire project.

.6 Source Quality Control Submittals:

.1 Submit 2 copies of mill test reports 4 weeks prior to fabrication of structural steel.

.1 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project.

.2 Provide mill test reports certified by metallurgists qualified to practice in Province of Manitoba, Canada.

.7 Fabricator Reports:

.1 Upon request, provide structural steel fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.

Part 2 Products

2.1 DESIGN REQUIREMENTS

.1 Design details and connections in accordance with requirements of CAN/CSA-S16 and CAN/CSA-S136 with CSA-S136.1 to resist forces, moments, shears and allow for movements indicated.

.2 Shear connections:

.1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction" when connection for shear only (standard connection) is required.

.2 Select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam, when shears are not indicated.

.3 For composite construction select or design minimum end connection to resist reaction resulting from factored movement resistance as tabulated in the "Handbook of the Canadian Institute of Steel Construction" assuming 100% shear connection with depth of steel deck and/or slab shown on drawings.

.4 Upon request, Submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Province of Manitoba, Canada for non standard connections.

2.2 MATERIALS

.1 Structural steel: All rolled or steel structural sections shall be G40.21-350W. All Hollow structural sections to be G40.21-350W class C. All angles, channels and plates shall be G40.21-300W.

.2 Anchor bolts: to CSA-G40.20/G40.21, Grade 300W.

.3 Bolts, nuts and washers: to ASTM A307, ASTM A325M, and ASTM A490/A490M as required.

.4 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.

.5 Shop paint primer:

.1 Steel not receiving finish painting: one coat of CISC/CPMA 1-73A quick drying shop primer

.2 Steel receiving finish painting: one coat of CISC/CPMA 2-75 quick drying shop primer.

.6 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m^2.

.7 Shear studs: to CSA W59, Appendix H.

2.3 FABRICATION

.1 Fabricate structural steel in accordance with CAN/CSA-S16, CAN/CSA-S136, and in accordance with reviewed shop drawings.

.2 Install shear studs in accordance with CSA W59.

.3 Continuously seal members by continuous welds where indicated. Grind smooth.

2.4 SHOP PAINTING

.1 Clean, prepare surfaces and shop prime structural steel as follows:

.1 Steel not receiving finish painting: One coat of CISC / CPMA 1-73a quick drying shop primer. Steel to be cleaned in conformance with SSPC-SP2.

.2 Steel receiving finish painting: One coat of CISC / CPMA 2-75 quick drying shop primer. Steel to be cleaned in conformance with SSPC-SP7.

.3 Exterior structural steel: All exterior structural steel shall be hot-dipped galvanized unless noted.

.2 Clean members, remove loose mill scale, rust, oil, dirt and foreign matter.

.3 Apply one coat of primer in shop to steel surfaces, except:

.1 Surfaces to be encased in concrete.

.2 Surfaces to receive field installed stud shear connections.

.3 Surfaces and edges to be field welded.

.4 Faying surfaces of slip-critical connections.

.5 Below grade surfaces in contact with soil.

.4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.

.5 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.

.6 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.

Part 3 Execution

3.1 APPLICATION

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

3.2 GENERAL

.1 Structural steel Work: in accordance with CAN/CSA-S16, CAN/CSA-S136.

.2 Welding: in accordance with CSA W59.

.3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

3.3 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing Work, report discrepancies and potential problem areas to Contract Administrator for direction before commencing fabrication.

3.4 MARKING

.1 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.

.2 Match marking: shop mark bearing assemblies and splices for fit and match.

3.5 ERECTION

.1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16, CAN/CSA-S136, and in accordance with reviewed erection drawings.

.2 Field cutting or altering structural members: to approval of Contract Administrator.

.3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.

.4 Continuously seal members by continuous welds where indicated. Grind smooth.

3.6 FIELD QUALITY CONTROL

.1 Inspection and testing of materials and Workmanship will be carried out by testing laboratory designated by Contract Administrator.

.2 Provide safe access and Working areas for testing on Site, as required by testing agency and as authorized by Contract Administrator.

.3 Submit test reports to Contract Administrator within 2 weeks of completion of inspection.

.4 City of Winnipeg will pay costs of tests as specified in Section 01 21 00 – Allowances.

.5 Test shear studs in accordance with CSA W59.

3.7 FIELD PAINTING

.1 Paint in accordance with Section 09 91 00 - Painting.

.1 Touch up damaged surfaces and surfaces without shop coat with primer to SSPC-SP7 except as specified otherwise. Apply in accordance: MPI Architectural Painting Specification Manual.

3.8 CLEANING

.1 Clean in accordance with Section 01 74 00 – Project Clean-Up.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 05 12 23 – Structural Steel For Buildings.

.2 Section 05 31 00 - Steel Deck.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-85.10-99, Protective Coatings for Metals.

.2 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturer's Association (CPMA)

.1 CISC/CPMA 2-75, Quick-Drying, Primer for Use on Structural Steel.

.2 CISC/CPMA 1-73a, Quick-Drying, One-Coat Paint for Use on Structural Steel.

.3 Canadian Standards Association (CSA International)

.1 CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA-S16-01, Limit States Design of Steel Structures.

.3 CSA-S136-94(R2001), Cold Formed Steel Structural Members.

.4 CSA-W47.1-92(R2001), Certification of Companies for Fusion Welding of Steel Structures.

.5 CSA-W55.3-1965(R1998), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.6 CSA-W59-03, Welded Steel Construction (Metal Arc Welding).

1.3 QUALITY ASSURANCE

.1 Submit 2 copies of mill test reports at least 4 weeks prior to fabrication of steel joists and accessories. Reports to show:

.1 Chemical and physical properties.

.2 Other details of steel to be incorporated into Work.

.3 Certification by qualified metallurgists confirming that tests conform to requirements of CSA G40.20/G40.21

.2 Upon request, supply affidavit prepared by fabricator of structural steel joists stating that materials and products used in fabrication conform to this specification.

1.4 DESIGN OF STEEL JOISTS AND BRIDGING

.1 Design steel joists and bridging to carry loads indicated on drawings in accordance with CAN/CSA-S16, CSA-S136.

.2 Design joists and anchorages for uplift forces as indicated.

.3 Ensure joists are manufactured to consider load effects due to fabrication, erection and handling.

.4 Limit floor and roof joist deflection due to specified live load to L/360 and deflection due to specified total load to L/240.

.5 Upon request, submit 2 copies of calculations and joist design drawings for typical joists for Contract Administractor review at least 4 weeks prior to fabrication and/or delivery.

1.5 SHOP DRAWINGS

.1 Submit shop details and erection drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit drawings stamped and signed by qualified professional engineer registered in the province Manitoba, Canada.

.3 Indicate on erection drawings, relevant details such as joist mark, depth, spacing, bridging lines, bearing, anchorage and details.

.4 Provide particulars, on shop drawings, relative to joist geometry, framed openings, splicing details, bearing and anchorage. Include member size, properties, specified and factored member loads, and stresses under various loadings, deflection and camber.

Part 2 Products

2.1 MATERIALS

.1 Structural steel: to CSA-G40.20/G40.21 and CSA-S136.

.2 Welding materials: to CSA-W59.

.1 Shop paint primer:

.1 Steel not receiving finish painting: one coat of CISC/CPMA 1-73A quick drying shop primer

.2 Shear studs: to CSA-W59, Appendix H.

2.2 FABRICATION

.1 Fabricate steel joists and accessories as indicated in accordance with CAN/CSA-S16.1, CSA-S136, and in accordance with reviewed shop drawings.

.2 Weld in accordance with CSA-W59.

.3 Provide top and bottom chord extensions where indicated.

.4 Provide diagonal and horizontal bridgings and anchorages as required.

.5 Weld studs to top chords for attachment purposes.

.6 Install shear studs in accordance with CSA-W59.

2.3 SHOP PAINTING

.1 Clean, prepare surfaces and shop prime structural steel as follows:

.1 Steel not receiving finish painting: One coat of CISC / CPMA 1-73a quick drying shop primer. Steel to be cleaned in conformance with SSPC-SP2.

.2 Clean members of loose mill scale, rust, oil, dirt and other foreign matter.

.3 Apply one coat of primer in shop to steel surfaces, except:

.1 Surfaces to be encased in concrete.
.2 Surfaces to receive field installed stud shear connections.
.3 Surfaces and edges to be field welded.
.4 Faying surfaces of slip-critical connections.
.5 Below grade surfaces in contact with soil.

.4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.

.5 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.

.6 Strip paint bolts, nuts, sharp edges and corners before prime coat is dry.

Part 3 Execution

3.1 GENERAL

.1 Structural steel Work: in accordance with CAN/CSA-S16, and CSA-S136.

.2 Welding: in accordance with CSA-W59.

.3 Companies to be certified under Division 1 or 2.1 of CSA-W47.1 for fusion welding and/or CSA-W55.3 for resistance welding.

.4 Provide certification that welded joints are qualified by Canadian Welding Bureau.

3.2 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing Work; report discrepancies and potential problem areas to Contract Administractor for direction before commencing fabrication.

3.3 FIELD QUALITY CONTROL

.1 Inspection and testing of materials and Workmanship will be carried out by testing laboratory designated by Contract Administractor.

.2 Testing laboratory will inspect representative joists for integrity, accuracy of fabrication and soundness of welds. Contract Administractor will determine extent of and identify all inspections.

.3 Submit test report to Contract Administractor 2 weeks after completion of inspection.

.4 City of Winnipeg will pay costs of tests as specified in Section 01 21 00 – Allowances.

.5 Test shear studs in accordance with CSA-W59.

3.4 ERECTION

.1 Erect steel joists and bridging as indicated in accordance with CAN/CSA-S16.1, CSA-S136, and in accordance with reviewed erection drawings.

.2 Complete installation of all bridging and anchorages before placing construction loads on joists.

.3 Field cutting or altering joists or bridging that are not shown on shop drawings: to be reviewed by Contract Administractor.

.4 Clean and touch up shop primer to bolts, welds, burned or scratched surfaces at completion of erection.

3.5 FIELD PAINTING

.1 Paint in accordance with Section 09 91 00 - Painting.

.1 Touch up damaged surfaces and surfaces without shop coat with primer to SSPC-SP7 except as specified otherwise. Apply in accordance: MPI Architectural Painting Specification Manual.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 05 12 23 – Structural Steel For Buildings.

.2 Section 05 21 00 – Steel Joist Framing.

1.2 REFERENCES

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

- .1 ASTM A653/A653M-01a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM A792/A792M-01a, Specification for Steel Sheet, 55%Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)

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

.3 Canadian Standards Association (CSA International)

- .1 CSA C22.2 No.79-1978(R1999), Cellular Metal and Cellular Concrete Floor Raceways and Fittings.
- .2 CAN/CSA-S16.1-94(R2000), Limit States Design of Steel Structures.
- .3 CSA-S136-94(R2001), Cold Formed Steel Structural Members.
- .4 CSA W47.1-92(R2001), Certification of Companies for Fusion Welding of Steel Structures.
- .5 CSA W55.3-1965(R1998), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
- .6 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

.4 Canadian Sheet Steel Building Institute (CSSBI)

- .1 CSSBI 10M-96, Standard for Steel Roof Deck.
- .2 CSSBI 12M-96, Standard for Composite Steel Deck.

1.3 DESIGN REQUIREMENTS

.1 Design steel deck using limit states design in accordance with CSA S136.

.2 Steel deck and connections to steel framing to carry dead, live and other loads including lateral loads, diaphragm action, composite deck action, and uplift as indicated.

.3 Deflection under specified live load not to exceed 1/360 of span.

1.4 SHOP DRAWINGS

.1 Submit shop drawings erection and shoring drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Province of Manitoba, Canada.

.3 Submit design calculations if requested by Contract Administrator.

.4 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.

.5 Indicate details of temporary shoring of steel deck, such as location, time and duration of placement and removal of shoring for concrete fill decks.

Part 2 Products

2.1 MATERIALS

.1 Zinc-iron Alloy (ZF) coated steel sheet: to ASTM A653/A653M structural quality Grade 230, with ZF75 coating, for interior surfaces not exposed to weather, unpainted finish, thickness as indicated on structural drawings.

.2 Decks to be painted: zinc-iron alloy coated decks suitable for finish painting.

.3 Zinc (Z) coated steel sheet: to ASTM A653/A653M structural quality Grade 230, with ZF75, coating, for exterior surfaces exposed to weather, thickness as indicated on structural drawings.

.4 Acoustic insulation: fibrous glass 17.5 kg/m^3 density profiled to suit deck flutes.

.5 Closures: as indicated in accordance with manufacturer's recommendations.

.6 Cover plates, cell closures and flashings: steel sheet with minimum base steel thickness of 0.76 mm. Metallic coating same as deck material.

.7 Primer: zinc rich, ready mix to CAN/CGSB-1.181.

.8 Shear studs: to CSA W59.

2.2 TYPES OF DECKING

.1 Steel roof deck: thickness and profile as per structural drawings, interlocking side laps.

.2 Acoustic steel roof deck: thickness and profile as per structural drawings, non-cellular, perforated on vertical face of flutes, interlocking side laps. Flat sheet for cellular deck.

.3 Composite steel floor deck: thickness and profile as per structural drawings, interlocking side laps.

Part 3 Execution

3.1 GENERAL

.1 Structural steel Work: in accordance with CAN/CSA-S136.

.2 Welding: in accordance with CSA W59, except where specified otherwise.

.3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel and/or CSA W55.3 for resistance welding.

3.2 ERECTION

.1 Erect steel deck as indicated and in accordance with CSA S136, and in accordance with reviewed erection drawings.

.2 Butt ends: to 1.5 to 3 mm gap. Install steel cover plates over gaps wider than 3 mm.

.3 Lap ends: to 50 mm minimum.

.4 Weld and test stud shear connectors through steel deck to steel joists/beams below in accordance with CSA W59.

.5 Immediately after deck is permanently secured in place, touch up metallic coated top surface with compatible primer where burned by welding.

.6 Prior to concrete placement, steel deck to be free of soil, debris, standing water, loose mil scale and other foreign matter.

.7 Temporary shoring, if required, to be designed to support construction loads, wet concrete and other construction equipment. Do not remove temporary shoring until concrete attains 75% of its specified 28 day compression strength.

.8 Place and support reinforcing steel as indicated.

3.3 CLOSURES

.1 Install closures in accordance with approved details.

3.4 OPENINGS AND AREAS OF CONCENTRATED LOADS

.1 No reinforcement required for openings cut in deck which are smaller than 150 mm square.

.2 Frame deck openings with any one dimension between 150 to 300 mm as with minimum L64x64x6.4 each side of opening perpendicular to flutes. Angle shall be welded to at least two flutes on each side of opening.

.3 Deck supplier shall reinforce openings over 300mm to 450mm across the flutes with suitable reinforcement based on a structural analysis of the loads involved.

.4 For deck openings with any one dimension greater than 450 mm and for areas of concentrated load, reinforce in accordance with structural framing details, except as otherwise indicated.

3.5 CONNECTIONS

.1 Install connections in accordance with CSSBI recommendations as indicated.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Materials and application of Wind-Load bearing steel stud systems.

1.2 REFERENCES

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

.1 ASTM A653/A653M-04a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM A792/A792M-03, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)

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

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.2 CSA W47.1-03, Certification of Companies for Fusion Welding of Steel.

.3 CSA W55.3-1965(R2003), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.

.4 CSA W59-03, Welded Steel Construction (Metal Arc Welding) (Metric Version).

.5 CAN/CSA S136-01, North American Specification for the Design of Cold-Formed Steel Structural Members.

.4 Canadian Sheet Steel Building Institute (CSSBI)

.1 CSSBI 50M-87, Lightweight Steel Framing Manual.

.2 CSSBI 52M-91, Lightweight Steel Framing Binder.

.3 CSSBI Fact Sheet #3 June 1994, Care and Maintenace of Prefinished Sheet Steel Building Products.

.4 CSSBI Technical Bulletin Vol. 7, No. 2 February 2004, Changing Standard Thicknesses for Canadian Lightweight Steel Framing Applications.

.5 CSSBI S5-04, Guide Specification for Wind Bearing Steel Studs.

.5 The Master Painters Institute (MPI) / Architectural Painting Specification Manual - February 2004

.1 MPI # 18, Organic Zinc Rich Primer.

1.3 SUBMITTALS

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

.2 Shop Drawings:

.1 Indicate design loads, member sizes, materials, design thickness exclusive of coatings, coating specifications, connection and bracing details, screw sizes and spacing, and anchors.

.2 Indicate locations, dimensions, openings and requirements of related Work.

.3 Indicate welds by welding symbols as defined in CSA W59.

.3 Upon requested, submit samples of framing components and fasteners to Contract Administrator.

.4 Prior to beginning Work, submit two certified copies of mill reports covering material properties.

1.4 QUALITY ASSURANCE

.1 Site Meetings: as part of Manufacturer's Services as described in PART 3 - FIELD QUALITY CONTROL, schedule Site visits, to review Work, at stages listed:

.1 After delivery and storage of products, and when preparatory Work is complete but before installation begins.

.2 Twice during progress of Work at 25% and 60% complete.

.3 Upon completion of Work, after cleaning is carried out.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Protect steel studs during transportation, Site storage and installation in accordance with CSSBI Sheet Steel Facts #3.

.2 Handle and protect galvanized materials from damage to zinc coating.

Part 2 Products

2.1 MATERIALS

.1 Steel: to CSA S136, fabricated from ASTM A653/A653M. Material that is 1.22mm and thinner shall be grade 230MPa steel. Material that is greater than 1.22mm shall be grade 345 MPa steel.

.1 Zinc coated steel sheet: quality to ASTM A653/A653M. Studs shall have a minimum Z180 designation coating. Z-girts and Hat channels located outside the exterior membrane shall have a minimum Z275 designation coating.

.2 Welding materials: to CSAW59 and certified by Canadian Welding Bureau.

.3 Fasten studs to tracks with #10 Tek screws each side. Corrosion protected with minimum zinc coating thickness of 0.008mm.

.4 Fasten tracks to concrete with X-ZF powder actuated fasteners. 3.7mm diameter x min. 19 mm embedment by Hilti Canada Inc. Minimum edge distance is 75mm. Install as per manufactuer’s requirements.

.5 Fasten tracks to steel with X-DAK 16 powder actuated fasteners. 3.7mm diameter x 16 LG by Hilti Canada Inc. Minimum edge distance is 25mm. Install as per manufacturer's requirements.

2.2 METAL FRAMING

.1 Steel studs: to CSA S136, fabricated from metallic coated steel, depth and thickness as indicated on structural drawings.

.2 Stud tracks: fabricated from same material and finish as steel studs, depth to suit.

.1 Bottom track: single piece.

.2 Top track: two piece telescoping.

.3 Bridging: fabricated from same material and finish as studs, 38 x 12 x 1.09 mm minimum thickness.

.4 Angle clips: fabricated from same material and finish as studs, 38 x 38 mm x depth of steel stud, 1.37 mm minimum thickness.

.5 Tension straps and accessories: as recommended by manufacturer.

2.3 SOURCE QUALITY CONTROL

.1 Ensure mill reports covering material properties are reviewed by Contract Administrator.

Part 3 Execution

3.1 GENERAL

.1 Do welding in accordance with CSA W59.

.2 Certification of companies: CSA W47.1 for fusion welding CSA W55.3 for resistance welding.

.3 Do Work to CSSBI S5.

3.2 ERECTION

.1 Erect components to requirements of reviewed shop drawings.

.2 Anchor tracks securely to structure at spacing indicated on the structural drawings.

.3 Erect studs plumb, aligned and securely attached with two screws minimum.

.4 Seat studs into bottom tracks two piece telescoping top track.

.1 Install 60.0 mm minimum telescoping track at top of walls where required to accommodate vertical deflection. The inner track shall be 70mm.

.1 Nest top track into deflection channel 40.0 mm.

.2 Do not fasten tracks together.

Joel A Smith 10-6-24 11:47 AM
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Joel A Smith 10-6-24 11:48 AM
Deleted: minimum of 30.0

Joel A Smith 10-6-24 11:48 AM
Deleted: and maximum of 40.0 mm

.3 Stagger joints.

.2 Install studs at not more than 50.0 mm from abutting walls, openings, and each side of corners and terminations with dissimilar materials.

.3 Brace steel studs with horizontal internal bridging at 1500 mm maximum.

.1 Fasten bridging to steel clips fastened to steel studs with screws or by welding.

.4 Frame openings in stud walls to adequately carry loads by use of additional framing members and bracing as indicated on structural drawings.

.5 Touch up welds with coat of zinc rich primer.

3.3 ERECTION TOLERANCES

.1 Plumb: not to exceed 1/500th of member length.

.2 Camber: not to exceed 1/1000th of member length.

.3 Spacing: not more than +/- 3.0 mm from design spacing.

.4 Gap between end of stud and track web: not more than 4.0 mm.

3.4 CUTOUTS

.1 Maximum size of cutouts for services as follows:

Member Depth	Across Member Depth	Along Member Length	Centre to Centre Spacing (mm)
92	40 max.	105 max.	600 min.
102	40 max.	105 max.	600 min.
152	65 max.	115 max.	600 min.

.2 Limit distance from centerline of last unreinforced cutout to end of member to less than 300 mm.

3.5 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

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

.2 Schedule Site visits, to review Work, as directed in PART 1 - QUALITY ASSURANCE.

.2 Notify Contract Administrator at least 48 hours in advance for periodic Site reviews.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Rooftop hatch safety railing systems. (KeeHatch)

1.2 RELATED SECTIONS

A. Section 07 55 00 – Roof System: Coordination of roof edge protection installation.

1.3 REFERENCES

A. Americans with Disabilities Act Accessibility Guidelines (ADA).

B. American National Standards Institute (ANSI):
1. A 21.1 - Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.
2. A 58.1 - Minimum Design Loads in Buildings and Other Structures.
3. A 117.1 - Accessible and Usable Buildings and Facilities.

C. ASTM International (ASTM):
1. ASTM A 47 - Standard Specification for Ferritic Malleable Iron Castings.
2. ASTM A 53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. ASTM A 153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

D. Occupational Safety and Health Administration (OSHA): 1910.23 - Guarding Floor and Wall Openings and Holes.

E. Underwriters Laboratories (UL): UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Including but not limited to indication of profiles, sizes, connections, sizes and types of fasteners and accessories; showing fabrication and installation of handrails and guardrails including but not limited to plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of Work.

D. Verification Samples: For each system specified, two samples, minimum size 6 inches (150 mm) long, representing actual system components and finishes.

1.5 QUALITY ASSURANCE

A. Railings Structural Requirements:

1. Handrail, wall rail and guardrail assemblies and attachments shall meet all applicable requirements of the most current National Building Code of Canada with Manitoba Amendments.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards. Store materials within absolute limits for temperature and humidity recommended by the manufacturer.

B. Protect finishes from damage.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Field Measurements: Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings.
1. Where field measurements cannot be made without delaying the railing fabrication and delivery, obtain guaranteed dimensions in writing by the Contractor and proceed with fabrication of products to not delay fabrication, delivery and installation.

C. Coordinate fabrication and delivery schedule of handrails with construction progress and sequence to avoid delay of railing installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Kee Safety, Inc., which is located at: 100 Stradtman St. ; Buffalo, NY 14206; Toll Free Tel: 800-851-5181; Email: request info (info@keesafety.com); Web: keesafety.com

B. Requests for substitutions will be considered in accordance with provisions of Section 00 11 16.

2.2 ROOFTOP HATCH SAFETY RAILING SYSTEMS (KEEHATCH)

A. Rooftop Hatch Safety Railing Systems: KeeHatch as manufactured by Kee Safety Inc.
1. Description: Safety railing system designed for safe egress/ingress through roof access hatches, and protection while hatch open; integrates with existing openings and ladderways.
2. Compliance:
   a. OSHA Standards 29 CFR 1910.23.
   b. OSHA Standards 29 CFR 1910.27.
3. Fittings: Kee Klamp fittings galvanized to ASTM A 153.
4. Pipes: Nominal 1-1/4 inch pipe, Schedule 40 pipe, galvanized to ≈STM A53.
5. System Configuration: Type RHSR-SS-3630 - Standard System; for roof hatches 30 inches (762 mm) by 36 inches (914 mm) with hatchway ladder mounted on 30 inch (762 mm) side of hatch opposite of hatch lid hinge.
6. Toeboards: No drilling required; upright hardware and splice kits for corners and straight sections as required for complete installation.
7. Safety Gates: Provide optional safety gates.

2.3 FABRICATION

A. Fit and shop assemble components in largest practical sizes for delivery to Site.

B. Upright tops shall be plugged with weather and light resistant material.

C. Assemble components with joints tightly fitted and secured. Accurately form components to suit installation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Prepare substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

B. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

C. Coordinate post setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete and masonry construction.
1. Coordinate delivery of anchorages to project Site.
2. Coordinate that blocking is in place for all mounting fasteners.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions including the following:
1. Fit exposed connections accurately together to form tight joints. For all connections with Kee Klamp fittings, each set screw is to be tightened to 29 foot pounds (39 N-m) of torque.
2. Perform cutting, drilling, and fitting required for installation of handrails. Set handrails and accurately in location, alignment, and elevation, measured from established lines and levels.
3. Set posts plumb within a tolerance of 1/8 inch (3 mm).
4. Install in 2 locations:
- around the interior hatch leading from the interior to the attic space,
- around the exterior hatch leading form the attic to the roof level.

3.3 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

PART 1 GENERAL

1.1 Related Work

.1 Doors and frames, Sections 08 11 14.
.2 Interior steel stud partitions, Section 09 22 16.
.3 Gypsum Board, Section 09 29 00.

1.2 References

.1 Canadian Standards Association (CSA)
  .1 CSA B111 - Wire Nails, Spikes and Staples.
  .2 CAN/CSA-O141 - Softwood Lumber.
  .3 CSA O151 - Canadian Softwood Plywood.
.2 National Lumber Grades Authority (NLGA)
  .1 Standard Grading Rules for Canadian Lumber.

1.3 Quality Assurance

.1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
.2 Plywood identification: by grade mark in accordance with applicable CSA standards.
.3 Comply with requirements of National Building Code (NBC) latest edition and supplements, Part 9 unless indicated otherwise.

PART 2 PRODUCTS

2.1 Materials

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
  .1 CAN/CSA-O141 - 91.
  .2 NLGA Standard Grading Rules for Canadian Lumber, latest edition and supplements.
.2 Structural light framing: Douglas Fir species, NLGA No. 2 Grade, S4S, 15% moisture content.
.3 Dimension lumber:
  .1 Light Framing: S4S, species group S-P-F, Construction grade.
  .2 Stud: S4S, species group Hem-Fir, Stud grade.
.4 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
  .1 Use S4S material
  .2 Board sizes: S-P-F species, NLGA standard or better grade.
  .3 Dimension sizes: S-P-F species, NLGA standard light framing or better
.5 Post and timbers sizes: "Standard" or better grade.
.6 Glued end-jointed (finger-jointed) lumber is not acceptable.
.7 Machine stress-rated lumber is acceptable for all purposes.
.8 Fasteners
  .1 In accordance with Part 9 of NBC 2010 as supplemented by the following requirements except where specific type is indicated.
  .2 Nails, spikes and staples: to CSA B111 1974.
  .3 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
  .4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or
  .5 Explosive fasteners will not be permitted.
  .6 Use surface fastenings of following types, except where specific type is indicated.
    .1 To hollow masonry, plaster and panel surfaces use toggle bolt.
    .2 To solid masonry and concrete use expansion shield with lag screw, lead plug with wood screw.
  .7 To structural steel use bolts through drilled hole, or welded stud-bolts or power driven self-drilling screws, or welded stud-bolts.
  .8 Galvanizing: hot-dipped galvanized to CAN/CSA-G164 M92, use galvanized fasteners for exterior Work, interior highly humid areas, pressure preservative treated lumber.

.9 Refer to Specification Detail Sheets for wood blocking in steel studs for attachment of miscellaneous items to steel stud partitions.

.9 Wood Preservative

.1 Preserved wood: Chemically pressure treated against rot, decay in accordance with CSA O80 Series-97.

.2 Surface applied wood preservative: to CSA O80 Series-97, surface applied, water repellant wood preservative, coloured, copper napthenate, 5% pentachlorophenol base.

.10 Pressure Treated Wood

.1 Wood materials: Douglas Fir for support of roof mounted ducts, pipes and mechanical equipment as detailed.

.2 Wood material shall be vacuum/pressure impregnated in accordance with CSA 080 Series-97 using approved wood preservative to a minimum net retention level of 0.4 lbs. Per cubic foot (6.4 kg per cubic metre).

.3 Wood material shall be dried after treatment to a moisture content of 19% or less.

.4 Supply preservative of sufficient quantity for field application to exposed wood as a result of ripping or cutting.

PART 3 EXECUTION

3.1 Installation

.1 Comply with requirements of NBC, Part 9 supplemented by following paragraphs.

.2 Install members true to line, levels and elevations. Space uniformly.

.3 Construct continuous members from pieces of longest practical length.

.4 Install spanning members with "crown-edge" up.

3.2 Erection

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other Work.

.3 Use fastenings of following types, except where specific type is indicated or specified:

.1 To hollow masonry, plaster and panel surfaces use toggle bolts.

.2 To solid masonry and concrete use expansion shield with lag screw, lead plug with wood screw.

.3 To structural steel use bolts through drilled hole, or welded stud-bolts or power driven self-drilling screws, or welded stud-bolts or explosive actuated stud-bolts.

3.3 Furring and Blocking

.1 Install furring and blocking as required to space-out and support casework, cabinets, surface applied fixtures and equipment, wall and ceiling finishes, facings, fascia, soffit, siding and other Work as indicated.

.2 Provided blocking in walls for wall mounted door stops.

.3 Align and plumb faces of furring and blocking to tolerance of 1:600.

3.4 Nailing Strips, Grounds and Rough Bucks

.1 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other Work.

.2 Except where indicated otherwise, use material at least 38mm thick secured with 9mm dia. corrosion resistant bolts located within 300mm from ends of members and uniformly spaced at 1200mm.

.3 Countersink bolts where necessary to provide clearance for other Work.

3.5 Fasteners

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other Work.

.3 Explosive fasteners WILL NOT BE PERMITTED.

3.6 Surface-Applied Wood Preservative

.1 Treat surfaces of wood materials exposed to exterior with surface-applied wood preservative, except where pressure treated material is indicated. Treat material before installation. Wherever possible, treat materials after cutting and fitting.

.2 Apply preservative by dipping, or by brush to completely saturate cut surfaces for minimum 3

minute soak on lumber and one minute soak on plywood.

.3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

.4 Treat material as indicated and as follows:

.5 Curbs, blocking, nailers on roof deck, except where pressure treated wood is indicated.

.6 Rough bucks, nailers, grounds at rough openings.

.7 Blocking, nailers, furring, for all exterior Work.

~ END ~

Part 1 General

1.1 SECTION INCLUDES

.1 Works in this section covers the supply and installation of a spray-in-place, closed-cell polyurethane foam insulation to the walls and soffits as shown and indicated on the drawings.

.2 This specification shall be read in conjunction with the attached drawings.

1.2 REFERENCES

.1 ULC S705.1-98 Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification (Replaces CGSB 51.23-92).

.2 ULC S705.2-98 Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Installer's Responsibilities Specification (Replaces CGSB 51.39-92).

.3 CGSB-51.46 Manual for Installers of Spray Urethane Foam Thermal Insulation.

.4 Canadian Urethane Foam Contractors Association, Manual for Installers of Spray Polyurethane Foam Thermal Insulation.

.5 CGSB 51-GP-23M Thermal Insulation, Urethane, Spray-in-Place.

1.3 SYSTEM DESCRIPTION

.1 Materials of this section shall provide R6 per inch closed-cell polyurethane thermal insulation, Type 2 air barrier and vapour retardant.

1.4 QUALITY ASSURANCE

.1 Contractor performing Work under this section must be licensed under CUFCA (Canadian Urethane Foam Contractors Association) Quality Assurance Program.

.2 Applicators performing Work under this section must be trained and certified by CUFCA (National Energy Conservation Association).

.3 Proof of license and certification to be submitted to the Contract Administrator upon request, prior to the commencement of Work.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Materials to be stored in a safe manner as recommended by the material manufacturer, and provincial regulations.

.2 Empty containers of isocyanates to be decontaminated or removed from Site on a daily basis. All disposals must comply with the requirements of WHIMIS, the City of Winnipeg and all other authorities having jurisdiction.

1.6 WARRANTY

.1 Warrant Work under this section against defects in Workmanship or material for a minimum period of two (2) years from date of substantial completion; such as but not limited to debonding or cracking.

.2 Promptly rectify, at Contractor's expense, defects or deficiencies which become apparent during the warranty period.

Part 2 Products

2.1 MATERIALS

.1 Sprayed polyurethane foam to meet the requirements of ULC S705.1-98.

.2 Test report from a certified testing laboratory indicating product meets the requirements of ULC S705.1-98 to be on file in the CUFCA office.

.3 Design RSI value as indicated in test report; minimum R6 per inch.

.4 Sprayed polyurethane foam to meet requirements for minimum Type 2 air barrier and vapour retardant requirements as per the National Research Council, and CMHC specifications' performance requirements.

.5 Products must provide a minimum Type 2 air barrier and comply as a vapour retardant, and have a flame spread rating less than or equal to twenty-five (25) when tested according to ASTM-E84. An acceptable product is:

.1 Enerfoam by Dow Chemical Company
.2 Heatlok SOYA by Demilec
.3 Foam-Lok by Lapolla
.4 CertaSpray by Certain Teed
.5 Polarfoam SOYA by Demilic
.6 Walltite ECO by BASF
.7 Alternate products will be reviewed for conformance. If the product meets the specification requirements, written approval will be provided in the form of an Addendum.

2.2 ACCESSORIES

.1 Primer as per manufacturers requirements and recommendations for surface conditions.

2.3 EQUIPMENT

.1 Spray equipment to be in accordance with ULC S705.2-98 and manufacturer recommendations for type application.

.2 Each proportioner to supply only one (1) spray gun.

Part 3 Execution

3.1 PREPARATION

.1 Mask and cover adjacent areas to protect from overspray.

.2 Surfaces to receive foam insulation shall be free of visible frost or moisture in any phase, oil, rust or other foreign matter which may compromise adhesion.

.3 Clean concrete surface and apply primers for special conditions, as required by manufacturer recommendations.

3.2 INSTALLATION

.1 Provide adequate protection as recommended by the insulation manufacturer and as follows:

.1 Provide temporary enclosures as requested, to prevent spray and noxious vapours from contaminating air beyond application area.

.2 Protect Workers as recommended by insulation manufacturer.

.3 Protect adjacent surfaces, furniture, finishes and equipment from damage by overspray, fall-out, and dusting of insulation materials.

.2 Prior to application, a test pattern shall be sprayed to ensure that proper equipment settings have been selected. Consideration shall be given to reactivity, pattern and appearance of the cellular plastic to ensure that each of these properties meets the requirements specified by the manufacturers of the equipment and the chemical components.

.3 The spray gun shall always be held perpendicular to the substrate being sprayed. (A different angle can cause elongation of cells diminishing the physical and thermal properties.)

.4 The chemical components shall be applied in passes to a clean, dry substrate, prepared in accordance with manufacturer requirements. The thickness of the insulation shall be ascertained by using a thickness gauge. Successive passes shall overlap to ensure a smooth surface, free of ridges. A final pass shall be applied to cover all the holes made by the gauges, bringing the insulation to the specified thickness.

.5 Because rigid polyurethane cellular plastic is combustible, it shall not be used at a continuous service temperature outside the range of -60^{o}C to +80^{o}C (such as in contact with chimneys, heater vents, steam pipes), unless the thermal insulation has been designed for use at other service temperatures as specified by the chemical manufacturer.

.6 Rigid polyurethane cellular plastic shall not be:

.1 Used on or in the vicinity of heat emitting devices, such as recessed lighting fixtures, at a lesser distance than 3" or as specified by the authority having jurisdiction;

.2 Used inside electrical outlets or junction boxes;

.3 Used to cover electrical wiring in the insulation by more than 3/4", unless a protective shielding is installed to prevent possible overheating of the electrical wiring;

.4 Directly exposed to water (i.e. liquid water as opposed to water vapour); and

.5 Exposed to continuous ultraviolet light.

.7 Because proper adhesion between the substrate and the thermal insulation is extremely important, the polyurethane cellular plastic shall not be applied on a substrate that is wet, damp, covered by frost, ice, oil, grease, dust, loose scale, rust or if the surface is otherwise unsuitable for the application. Nor shall the cellular plastic be applied on loose fill materials.

.8 Climatic conditions, such as humidity over 80%, wind, sun/shade and ambient/substrate temperature difference over 17^{o}C can adversely affect the application, the reaction times and the physical properties of the thermal insulation. Therefore, appropriate chemical components (system) shall be chosen for the specific temperature conditions of application in consultation with the chemical manufacturer. When necessary, steps shall be taken to overcome the conditions such as installation of wind screens or by increasing the substrate temperature.

3.3 APPLICATION

.1 Spray-application of polyurethane foam shall be per formed in accordance with ULC S705.2-98.

.2 Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer.

.3 Apply in consecutive passes as recommended by manufacturer to thickness as indicated on drawings.

.4 Finished surface of foam insulation to be free of voids and imbedded foreign objects.

.5 Remove masking materials and overspray from adjacent areas immediately after foam surface has hardened. Ensure cleaning methods do not damage Work performed by other sections.

3.4 TOLERANCES

.1 Maximum allowable variation from indicated thickness: 1/4".

3.5 CLEANING

.1 Upon completion of foam installation, provide access for Contract Administrator to facilitate inspection of Work.

.2 Clean-up all material and clean Site to pre-construction form.

.3 Patch and prime drywall, polyethylene air barrier, etc. as per the specifications and drawings.

END OF SECTION

PART 1 GENERAL

1.1 Related Work

.1 Fire stopping and smoke seals within mechanical assemblies (i.e. inside ducts, dampers).

.2 Ensure all penetrations through existing fire rated partitions and floors are fire stopped to maintain rating of wall and floor. Fire stopping of mechanical or electrical penetrations is to be completed under this section.

1.2 References

.1 Underwriter's Laboratories of Canada (ULC)

.1 ULC-S115, Fire Tests of Firestop Systems.

1.3 Submittals

.1 Submit shop drawings, and product data in accordance with Section 01 33 00 – Submittals.

.2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job Site. Include manufacturer's printed instructions for installation.

.3 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.

PART 2 PRODUCTS

2.1 Materials

.1 Fire stopping and smoke seal systems: in accordance with ULC S115.

.1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ULC-S115 and not to exceed opening sizes for which they are intended and conforming to special requirements specified.

.2 Firestop system rating: in accordance with ULC-S115, suitable for application.

.2 Service penetration assemblies: certified by ULC in accordance with ULC S115 and listed in ULC Guide No. 40 U19.

.3 Service penetration fire stop components: certified by ULC in accordance with ULC-S115 and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC.

.4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.

.5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.

.6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.

.7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.8 Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

.9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.10 Sealants for vertical joints: non-sagging.

2.2 Labels

.1 All new smoke and fire rated walls constructed or renovated in the Centre shall be labelled with the appropriate hour rating.

.2 "Rated" walls shall be identified with a stencil containing the following 25 mm high text:

Warning: This is a XXXX rated wall. Do not penetrate this wall without notifying the The City and repairing the wall to the designed rating.

.3 The stencil shall indicate the designed hour rating (i.e. "3/4 hour" , "1 hour", etc) or where the wall only requires smoke sealing, it shall indicate "smoke seal".

.4 The stencil shall be located every 2 meters on center. Or every 6 meters on center, but be complete with a red 75mm line joining the stencils.

.5 Both sides of the rated walls shall receive the warning stencils, as well as on both sides of any intersecting walls.
.6 Refer to project drawings for locations and rating of walls.

PART 3 EXECUTION

3.1 Preparation

.1 Examine sizes and conditions of voids to be filled to establish correct thickness and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.
.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.
.3 Maintain insulation around pipes and ducts penetrating fire separation.
.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces. Remove stains on adjacent surfaces.

3.2 Installation

.1 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.
.2 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.
.3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
.4 Tool or trowel exposed surfaces to a neat finish.
.5 Remove excess compound promptly as Work progresses and upon completion.

3.3 Review

.1 Notify Contract Administrator when ready for review and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

3.4 Schedule

.1 Fire stop and smoke seal at:
  .1 Penetrations through fire-resistance rated gypsum board partitions, floors and walls.
  .2 Openings and sleeves installed for future use through fire separations.
  .3 Around mechanical and electrical assemblies penetrating fire separations.
  .4 Rigid ducts: greater than 129 cm² (20 in²): fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
  .5 Existing openings in fire-rated gypsum board paritions within area of Work.

3.5 Special Requirements

.1 Location of special requirements for fire stopping and smoke seal materials at openings and penetrations in fire resistant rated assemblies are as follows:
  .1 Non dust generation: at all locations.
  .2 Movement: 50% at building expansion and control joints.
  .3 Designed for re-entry, removable at: cable trays.

3.6 Clean Up

.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.
.2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

~ END ~

PART 1 GENERAL

1.1 Related Work

.1 Section 06 10 00: Rough Carpentry.

.2 Section 09 22 16: Building-in frames into steel stud walls.

1.2 Requirements of Regulatory Agencies

.1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104-M80 and CAN4-S105-M85 for ratings specified or indicated.

.2 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

1.3 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 33 00.

.2 Provide for each type of door and frame, elevations of all doors and frames, jamb and head details for all frame types, meeting and style details on pairs of doors, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, glazed openings, door grilles, arrangement of hardware, fire rating, method of anchorage, junction boxes and conduit for electrical hardware and wiring.

.3 For each door and frame scheduled for electrical hardware, submit detailed shop drawings indicating location and size of junction boxes, conduit cut-outs and all other information related to electrical hardware. This should include information on interrelated systems such as fire alarm and security systems/controls. Coordinate with electrical specifications.

.4 Include schedule identifying each unit, with door marks, numbers relating to numbering on drawings, in Door Schedules.

PART 2 PRODUCTS

2.1 Materials

.1 Sheet steel: to ASTM A653/A653M-01, commercial grade, cold rolled, annealed, stretcher levelled, pickled, ZF75 (Wiped Coat) zinc coating to ASTM A653/A653M-01.

.2 Frames: fully welded combination type, 16 gauge core thickness steel.

.3 Flush type doors: face sheets 18 gauge core thickness steel.

.4 Honeycomb core: structural core, resin impregnated kraft paper, 1" cell size required thickness.

.5 Insulated core: rigid urethane foam panel core, required thickness, R11 after door panel fabrication.

.6 Reinforcing channel: to CSA G40.20/G40.21-98, type 300 W.

.7 Floor anchor, wall anchor: minimum 16 gauge core thickness steel, channel spreader: minimum 18 gauge core thickness steel.

.8 Guard boxes: minimum 22 gauge core thickness steel.

.9 Hinge reinforcing: minimum 7 gauge core thickness steel, full height, full cavity width.

.10 Lock reinforcing: minimum 16 gauge core thickness steel.

.11 Strike reinforcing: minimum 12 gauge core thickness steel.

.12 Surface applied hardware reinforcing: minimum 12 gauge core thickness steel.

.13 Astragals: minimum 2.0 mm core thickness steel, width indicated, required.

.14 Fasteners: expansion bolts, galvanized, approved design, to ASTM A307-00.

.15 Glazing stops: formed, minimum 20 gauge core thickness sheet steel, ZF75 (Wiped Coat) zinc coating, tamperproof, screw fixed type, to ULC approval.

.16 Door bumpers: black neoprene.

.17 Primer to reinforcing, attachment steel: to CAN/CGSB-1.40-97.

.18 Primer to zinc coated sheet steel: to CAN/CGSB-1.181-99.

2.2 Fabrication

.1 Fabricate doors and frames as detailed, to Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA) Canadian Manufacturing Specifications for Steel Doors and Frames, latest edition; except where specified otherwise, reviewed shop drawings, ULC requirements. Reinforce door and frames to suit hardware requirements specified Section 08 71 10.

.2 Blank, reinforce, drill and tap doors and frames for mortised hardware using templates provided by Section 08 71 10. Reinforce doors and frames for surface mounted hardware.

.3 Continuously weld joints full length, grind, sand flush, smooth, clean exposed surfaces.
.4 Shop prime cold rolled steel sheet.
.5 Apply, at factory, touch up primer to doors and frames manufactured from galvanized steel where coating has been removed during fabrication.
.6 All doors and frames to be ULC 20 minute fire rated doors.
.7 Attach labels to fire rated doors, frames via mechanical fasteners (pop rivets).

2.3 Doors

.1 Fabricate hollow metal doors of type, thickness, dimensions scheduled, indicated.
.2 Fabricate flush doors with honeycomb core (3/4" cell size, thickness to fill door core).
.3 Close door top with flush surface, spot welded channel closure, door bottom with recessed, spot welded channel closure minimum 1" deep. Weld channels to both face sheets to stiffen door laterally. Apply waterproof filler to top channel of exterior doors.
.4 Stitch weld longitudinal edge joints maximum 6" o.c. Fill with metallic paste filler, grind, dress, sand flush. Bevel strike door edge minimum 1/8" in 2".
.5 Build in required hardware reinforcing, guard boxes. Provide closer reinforcement both sides all doors, including doors not scheduled to receive closers.

2.4 Frames

.1 Fabricate pressed metal frames to design, profile, dimensions scheduled, indicated, fully welded combination type as indicated, scheduled.
.2 Weld mitres, joints continuously on inside welded frame profile.
.3 Fabricate sidelights, borrowed lights, screen frames to receive glazing indicated. Reinforce frames internally with structural shapes required.
.4 Flange frame returns as indicated.
.5 Reinforce frame heads without loose lintels provided by others, with bent plate channels, minimum 9 gauge thick. Reinforce frame heads wider than 2440 mm.
.6 Provide head/transom rail to suit concealed overhead door closers, automatic door operators. Co-ordinate with adjacent construction over door head.
.7 Reinforce frames for surface mounted hardware.
.8 Provide corrugated, perforated, adjustable steel jamb anchors, Underwriter approved type, welded in door frames installed in masonry walls. Provide three anchors per jamb for openings to 2135 mm high, four anchors per jamb for openings over 2135 mm high.
.9 Provide steel jamb anchors, suitable design, securely welded inside each jamb, to door and sidelight frames in steel stud partitions. Provide four anchors per jamb for openings to 2135 mm high, five anchors per jamb for openings over 2135 mm high.
.10 Weld base/floor anchors inside, full width jamb profile, punched for 6 mm diameter expansion bolts for fixing to floor slab.
.11 Weld in two channel spreaders per frame, ensure proper frame alignment.
.12 Protect strike, hinge reinforcements, weld guard boxes to frames.
.13 Install three bumpers on strike jamb for single doors, two bumpers at head for double doors.
.14 Provide steel anchors welded to frames 610 mm o.c. on four sides, minimum two anchors each frame side.
.15 Provide removable glazing stops on one side, secured with countersunk, flat head screws, 200 o.c.
.16 Fabricate thermally broken exterior door frames with two piece steel core sections separated with closed cell polyvinyl chloride thermal breaks to CAN/CGSB-82.5-M88.

2.5 Shop Painting

.1 Clean metal surfaces of loose scale, shavings, filings, dirt, dust, other objectionable materials. Use wire brushes, other approved methods. Remove grease, oil with benzene, other similar Xylol cleaners.
.2 Touch up galvanized finish damaged during fabrication, cleaning.
.3 Apply one shop coat light grey coloured primer to reinforcing, attachment steel surfaces, two shop coats where in contact with concrete, masonry.

PART 3 EXECUTION

3.1 Installation General

.1 Install labelled doors, frames in accordance with NFPA 80.

3.2 Door Installation

.1 Install doors, hardware in accordance with hardware templates, manufacturer instructions.
.2 Provide even margins between doors and jambs and doors and finished floor as follows.
.3 Hinge side: 1.0 mm.
.4 Latchside and head: 1.5 mm.
.5 Finished floor, top of carpet, thresholds: 6 mm.
.6 Allow for floor fluctuations.
.7 Meeting edges of pairs of doors: 1.5mm
.8 Installations exceeding these requirements will be rejected.
.9 Leave wrapping, factory applied protection on finish hardware. Replace on completion of hardware installation if removed.
.10 Adjust operable parts for correct function.
.11 Install door grilles, if applicable.

3.3 Frame Installation

.1 Set frames plumb, square, level and at correct elevation. Maximum diagonal distortion of 1.6mm (1/16")
.2 Secure anchorages and connections to adjacent construction.
.3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.
.4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
.5 Fit throat return flanges tight to finished wall surfaces.
.6 Fill space between frame, masonry, concrete with mortar, concrete fill.
.7 Exterior Door Frames - Thermally broken

3.4 Protection

.1 Protect hollow metal Work from damage, weather after installation.
.2 Touch up with primer galvanized finish damaged during installation.

~ END ~

PART 1 GENERAL

1.1 Related Work

.1 Hardware schedule shall be prepared by an individual employed by the hardware supplier. This individual shall be a certified Architectural Hardware Contract Administrator (AHC or DAHC) and shall be a member of the Door and Hardware Institute or shall have a minimum of 5 years experience in the architectural hardware trade and shall have successfully performed Work similar to the size and nature of this project. Proof of qualifications shall be presented to Contract Administrator upon request.

.2 Supply and Installation of hardware for:

.1 Section 08 11 14: Steel doors and frames.

1.2 Reference Standards

.1 Standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association unless specified otherwise.

1.3 Requirements of Regulatory Agencies

.1 Use ULC listed and labelled hardware for doors in fire separations and exit doors.

1.4 Hardware Schedule

.1 Submit hardware schedule in accordance with Section 01 33 00.

.2 Indicate hardware proposed for approval, including make, model, material, function, finish and other pertinent information.

1.5 Maintenance Data

.1 Provide maintenance data, parts list, and manufacturer's instructions for each type of door closer, lockset, door holder and fire exit hardware for incorporation into maintenance manual specified in Section 01 78 00.

.2 Brief maintenance staff regarding proper care, cleaning, and general maintenance.

1.6 Maintenance Materials

.1 Supply two sets of wrenches for door closers, locksets and fire exit hardware. At completion, turn over to the City all tools provided by hardware manufacturer for installation of equipment, such as wrenches, dogging keys, etc.

1.7 Delivery and Storage

.1 Store finishing hardware in locked, clean and dry area.

.2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location

PART 2 PRODUCTS

2.1 Hardware Items

.1 Acceptable manufacturers:

.2 Locksets: Schlage, Best, Abloy

.3 Closers: LCN

.4 Butts: Stanley, Hager

.5 Other hardware: as scheduled or approved equal in accordance with B6.

.6 Assume hardware list not entirely inclusive.

.7 Examine drawings, specifications, determine extent, quantity hardware required.

.8 Provide all items required to complete Work.

.9 Notify Contract Administrator during tendering where group codes do not agree with apparent intended use, function of door.

.10 All hardware to be supplied with 20 minute ULC rating.

2.2 Lock Sets, Latch Sets

.1 Mark, tag, itemize by number at factory, indicating keying and room numbers as per architectural drawings.

.2 Provide minimum 125mm (5") backset for locks, latch sets, unless door stile will only accommodate 70mm (2 3/4").

.3 Install 125mm(5") backset locks with one Schlage A501-567 sleeve, or approved equal in accordance with B6.

2.3 Hinges, Pivots, Butts

.1 Provide one and a half pairs hinges to doors maximum 915mm (3' 0") wide, 2134mm (7' 0") high, two pairs on doors over 2285mm (3' 0") wide, 2134mm (7' 0") high.

2.4 Fastenings

.1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.2 Exposed fastening devices to match finish of hardware.

.3 Use fasteners compatible with material through which they pass.

PART 3 EXECUTION

3.1 Installation Instructions

.1 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their Work to receive hardware.

.2 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 Hardware Locations

.1 Knobs, levers at centre of door.

.2 These dimensions are to be used as a general guide only in the placement of hardware. Where special items are concerned, or uncertainty exists, check with the Contract Administrator before fitting.

3.3 Final Inspection

.1 The hardware supplier or his authorized representative shall, upon completion of the Work, visit the job Site, check the installation of all hardware and certify in writing to the Contract Administrator that the hardware as specified has been correctly installed and is in proper Working order.

3.4 Hardware Schedule

.1 Submit hardware schedule in accordance with Section 01 33 00 - Submittals.

.2 Submit six (6) copies of proposed hardware schedule to Contract Administrator for review. Hardware schedule shall be in vertical format, typewritten on 8 1/2" x 11" sheets.

.3 Include title sheet indicating:

- .1 Date
- .2 HSC Project Name and Number
- .3 Contract Administrator File No.
- .4 General Contractor name, address, telephone number
- .5 Hardware Supplier name, address, telephone number
- .6 Name of individual who has prepared hardware schedule.

.4 Organized Hardware Schedule by HSC door numbers identified in project documents, in numerical sequence in ascending order. An additional reference number may be assigned for reference purposes. For each door number identify the following:

- .1 HSC door number
- .2 Hand of door
- .3 Door size
- .4 Door and frame material
- .5 Fire rating
- .6 All hardware components listed by item, quantity, model number, size, finish and manufacturer.

3.5 Maintenance Data

.1 Provide operation and maintenance data for finish hardware for incorporation into Operations and Maintenance Manual specified in Section 01 33 00 - Submittals. Submit data at time of submittal of hardware schedule.

.2 Include all information for all finish hardware used in this project, including but not limited to:

- .1 Complete list of all items used.
- .2 Assembly diagrams c/w parts list and part numbers for all items.
- .3 Manufacturer's instructions for each item.
- .4 For electrical and electronic hardware include engineering specifications and data for all components; electrical and electronic theory of operation; electrical and electronic schematics; as-built wiring and interconnection diagrams; procedures for repair and maintenance, user manuals, assembly diagrams c/w parts lists and part numbers.

.5 Name, address, telephone number of suppliers/installers and manufacturers.

.1 All lock cylinders (temporary and final) shall be installed by Contractor.

~ END ~

PART 1 GENERAL

1.1 Related Work

.1 Section 09 29 00, Gypsum board.
.2 Section 01 00 10, General Instructions.
.3 Section 06 10 00, Wood framing, grounds, blocking.
.4 Section 08 11 14, Hollow metal doors and frames.

1.2 References

.1 Do Work in accordance with CSA A82.31-M1980 except where specified otherwise.

PART 2 PRODUCTS

2.1 Materials

.1 Non loadbearing channel stud framing: to ASTM C645-00, stud size as scheduled and as indicated, roll formed from electro galvanized steel sheet, knock out service holes at 450mm o.c., fabricated for screw attachment of gypsum wall board.
.2 Metal stud gauges:
  .1 General interior framing: 25 ga. steel core thickness.
  .2 Interior framing for walls scheduled for cement backer board application: 20 ga. steel core thickness.
  .3 Interior jamb studs at all openings: 20 ga. steel thickness.
.3 Floor and ceiling tracks: to ASTM C645-00, galvanized metal, widths to suit stud sizes, 50mm flange height, for interior partitions, 25 ga., where double top track required outer top track, 20 ga. loadbearing framing as scheduled on structural drawings.
.4 Metal channel stiffener: 37mm x 19mm x 16 ga. cold rolled steel, galvanized.
.5 Metal furring:
  .1 Drywall furring channels: 25 ga. steel thickness, galvanized steel channels for screw attachment of gypsum board.
.6 Suspension accessories:
  .1 Metal furring runners, hangers, tie wires, inserts, anchors: to CSA A82.30M, galvanized.
  .2 Wire hangers: minimum 8 ga. galvanized mild steel.
.7 Fastenings, adhesives, filling compounds:
  .1 Nails, screws and staples: to CSA A82.31M. Use corrosion resistant screws for exterior sheathing and interior wet areas.
  .2 Stud adhesive: to CAN/CGSB-71.25 M88.
  .3 Laminating compound: to CSA A82.31M, asbestos free.
  .4 Joint compound: to CSA A82.31M, casein base powder compound, asbestos free.
  .5 Joint tape: 50mm perforated Kraft paper tape.
.8 Sealants:
  .1 Acoustic sealant: to Section 07 92 00, Type 6.
  .2 Fire stop sealant: to Section 07 84 00.
  .3 Caulking compound: to Section 07 92 00, Type 5.
  .4 Insulating sill gaskets: polyurethane foam, 6mm thick, nominal 85mm or 135mm wide rolls, Dow Chemical manufacture, “Ethafoam 221", Plasti-Fab manufacture “Sill Seal”.
  .5 Polyethylene: to CAN/CGSB-51.34 M86, Type 2, 6 mil thickness, clear.

PART 3 EXECUTION

3.1 Erection

.1 Metal Studs
  .1 Align partition tracks at floor and ceiling and secure at 600mm o.c. maximum, screwed to concrete or steel structure. Install sill insulation gasket below floor track for sound insulated partitions.
  .2 Place studs vertically at 400mm centres unless indicated otherwise and not more than 50mm from abutting walls and corners. Install studs tight to concrete or concrete block walls where sound insulated partitions meet these walls.

.3 Extend partition studs to underside of structure except where indicated otherwise. Extend acoustic baffle from above finished ceiling to underside of structure in line with wall below, where indicated.
.4 Position studs in tracks at floor and ceiling, and attach studs to tracks using screws.
.5 Maintain clearance under beams and ceilings to avoid transmission of structural loads to studs. Use double top track detail, with top track inside 50mm deep outer track to form slip joint. Do not fasten top track or gypsum board to outer top track.
.6 Erect metal studding to tolerance of 1:1000.
.7 Cross brace steel studs at 1200mm o.c. to provide rigid installation to manufacturer's instructions.
.8 Provide two studs of 20 ga. thickness extending from floor to full height of partition at each side of all door openings and at all other openings wider than stud centres specified. Secure studs together, 50mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
.9 Erect track at head of door openings and at head and sills of sidelights and window openings to accommodate intermediate studs. Provide double headers at all openings. Secure intermediate studs to both tracks as per manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
.10 Coordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
.11 Coordinate erection of studs with demountable partition (NIC) supplier.
.12 Coordinate erection of studs with installation of door/window frames, other openings and special supports or anchorage for Work specified in other Sections.
.13 Use minimum 20 ga. steel studs spaced at maximum 300mm o.c. wherever cement backer board is scheduled or indicated.
.14 Install steel studs or furring channel between studs for attaching electrical and other boxes.
.15 For sound insulated partitions, apply continuous beads of acoustical sealant to joint between top track and structure above, on each side of top track, and to each side of abutting stud where sound insulated partitions meet concrete or concrete block walls.
.16 Coordinate with Section 06 10 00 for installation of wood blocking for support of millwork cabinets, and miscellaneous accessories and other wall mounted equipment.

.2 Ceilings and Bulkheads

.1 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with CSA A82.31M, except where indicated otherwise.
.2 Install Work level to tolerance of 1:1200.
.3 Provide additional hangers as required to support all items suspended from suspended and furred ceilings, such as diffusers, light fixtures, etc. Refer to drawings and specifications and co ordinate with other trades for specific items.
.4 Support light fixtures by providing additional ceiling suspension hangers within 150mm of each corner and at maximum 600mm around perimeter of fixture.
.5 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
.6 Install 3/4" x 2 1/2" furring channels parallel to, and at exact locations of steel stud partition header track.
.7 Furr for gypsum board faced vertical bulkheads within or at termination of ceilings.
.8 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

.3 Wall Furring

.1 Install wall furring for gypsum board wall finishes in accordance with CSA A82.31M, except where indicated otherwise.
.2 Frame openings and around built in equipment, cabinets, access panels, etc. on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
.3 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

.4 Furr to special shapes and profiles as indicated. Brace as required to provide rigid framework.

~ END ~

PART 1 GENERAL

1.1 Related Work

.1 Metal stud systems – interior framing, Section 09 22 16.
.2 Painting, Section 09 91 00.

1.2 References

.1 American Society for Testing and Materials (ASTM)
  .1 ASTM C 1396 - Specification for Gypsum Board.
  .2 ASTM C 475 - Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  .3 ASTM C 840 - Specification and Finishing of Gypsum Board.
  .4 ASTM C 954 - Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs From 0.0333 in. (0.84 mm) to 0.12 in. (2.84 mm) in Thickness.
  .5 ASTM C1002, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  .6 ASTM C 1047 - Accessories for Gypsum Wallboard and Gypsum Veneer.
  .7 ASTM C 1396 - Specification for Gypsum Board.
.2 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-51.34 - Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.
.3 Underwriters Laboratories of Canada (ULC)
  .1 CAN/ULC-S702, Standard for Mineral Fibre Thermal Insulation for Buildings.

PART 2 PRODUCTS

2.1 Gypsum Board

.1 Standard: to CSA A82.27M, Type X (fire rated), 16mm thickness, 1220mm wide X maximum practical length, ends square cut, edges tapered.
.2 Water resistant board: to CSA A82.27M, 16mm thickness, 1220mm wide x maximum practical length, ends square cut, edges tapered.
.3 Interior ceiling board: to CSA A82.27M, 12mm thickness, 1220mm wide x maximum practical length, ends square cut, edges tapered.

2.2 Cement backer board

.1 Fibre reinforced portland cement backer board, thickness indicated, 2420mm wide x maximum practical length. Use manufacturers' recommended screw fasteners and washers. Approved products: Wonderboard; Durock; Latapanel.

2.3 Acoustic insulation

.1 Non-Rated Walls: Fibreglass, friction fit batts, thickness to suit stud depth, width to suit stud spacing, Fibreglass Canada manufacture, “Noisestop”.
.2 Rated Walls: CAN/ULC-S702, preformed mineral fibre processed from rock or slag, friction fit batts, unfaced; thickness as indicated, Roxul Acoustical Fire Batts (AFB).
.3 Rigid extruded polystyrene: to CAN/ULC S701, Type 4, compressive strength 210 kPa, thickness as indicated, shiplapped edge, CFC free and HCFC free without ozone depletion potential greater than zero, EcoLogo certified.

2.4 Metal Furring and Suspension Systems

.1 Metal furring, runners, hangers, tie wires, inserts, anchors: to ASTM C 1280, galvanized
.2 Drywall furring channels: 25 gauge galvanized steel channels for screw attachment of gypsum board.
.3 Wire hangers: minimum 12 gauge galvanized mild steel.

2.5 Fastenings and Adhesives

.1 Screws:
  .1 For metal framing less than 20 gauge: to ASTM C1002.

.2 For metal framing 20 gauge and thicker: to ASTM C954.

2.6 Accessories

.1 Casing beads, corner beads: fill type, 25 ga. thickness commercial grade sheet steel with G90 zinc finish to ASTM A653/A653M-01, perforated flanges; longest practical lengths, one piece wherever possible.

.2 Cornice cap: 12mm deep x partition width, of 16 ga. thickness galvanized sheet steel, prime painted. Include splice plates for joints.

.3 Acoustic sealant: to Section 07 92 00, Type 6.

.4 Fire stop sealant: to Section 07 84 00.

.5 Caulking compound: to Section 07 92 00, Type 5.

.6 Insulating sill gaskets: polyurethane foam, 6mm thick, nominal 85mm or 135mm wide rolls, Dow Chemical manufacture, “Ethafoam 221", Plasti-Fab manufacture “Sill Seal”.

.7 Polyethylene: to CAN/CGSB-51.34, 6 mils thick.

.8 Joint compound and paper joint tape: to ASTM C 475, asbestos free.

PART 3 EXECUTION

3.1 Gypsum Board Application

.1 Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical equipment and other Work which may be concealed behind gypsum board has been installed and approved by Contract Administrator.

.2 Apply single or double layer gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws is 300mm o.c.

.3 Apply water resistant gypsum board at all ceramic tile areas, adjacent to slop sinks in janitor’s closets and soiled utility rooms. Apply sealant to edges, ends, cut outs which expose gypsum board core.

.4 For fire rated partitions apply first and second layers with screw fasteners. Screw spacing to be 200mm o.c. around perimeter and 300mm o.c. in field of sheet.

.5 Install gypsum wall board, including metal casing beads, etc. down to floor line. Do not leave a gap. This is required for proper installation of coved bases by flooring trades.

.6 Do not use cracked or damaged pieces. Ensure corners are solid and well finished. Poor Workmanship will be reason for rejection.

.7 Coordination gypsum board installation with location of recessed corner guards.

.8 At sound insulated partitions apply continuous 10mm diameter bead of acoustical sealant at all penetrations of electrical and mechanical services, full perimeter of cut outs around electrical boxes, ducts, and other penetrations.

.9 Where gypsum wall board is installed above finished ceilings, fit Work tight to all items penetrating gypsum Work. Seal around full perimeter of items with caulking. Use fire retardant caulking at fire rated enclosures, acoustical caulking elsewhere.

3.2 Fibre Backer Board Installation

.1 Apply fibre backer board in accordance with manufacturer's instructions. Leave 3/16" gap at all vertical and horizontal joints and corners, including joints and corners at dissimilar materials. Use 1 1/4" galvanized metal screws spaced at 6" o.c. maximum. Taping of joints by Section 09 30 13 Ceramic Tile. Skim coat all exposed areas designated to be painted.

3.3 Acoustic Installation

.1 Install acoustic batt insulation where indicated. Cut and trim insulation to fit tight around protrusions, electrical boxes, etc., leave no voids. Do not compress batts.

.2 Install acoustic baffles above walls where indicated. Refer to details for construction.

3.4 Accessories

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150mm o.c. using contact adhesive for full length.

.2 Install casing beads around perimeter of suspended ceilings and bulkheads.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with acoustic sealant.

3.5 Control Joints

.1 Construct control joints of two back to back casing beads set in gypsum board facing and supported independently on both sides of joint.

.2 Provide continuous polyethylene dust barrier behind and across control joints.

.3 Locate control joints where indicated, and at the following locations:

.1 where partitions or furring abuts a structural element or dissimilar wall or ceiling.

.2 where a ceiling or bulkhead abuts a structural element or dissimilar wall or other vertical penetration.

.3 construction changes within plane of the partition or ceiling.

.4 partition or furring runs exceed 9 150 mm

.5 ceiling dimensions exceed 15 250 mm for gypsum board in either direction

.6 wings of "L", "U" and "T" shaped ceiling areas are joined.

.7 expansion or control joints occur in structural elements of the building.

.4 Install control joints straight and true.

3.6 Expansion Joints

.1 Construct expansion joints as indicated, at building expansion and construction joints. Provide continuous poly dust barrier.

.2 Install expansion joints straight and true.

3.7 Access Doors

.1 Install access doors to electrical and mechanical fixtures specified in respective Sections.

.2 Rigidly secure frames to furring or framing systems.

3.8 Taping and Filling

.1 Finish face panel joints and internal angles with joint system consisting of joint compound installed according to manufacturer's directions and feathered out onto panel faces.

.2 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

.3 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed.

.4 On all walls tape and fill joints, screw heads and corner beads above finished ceilings to full height of gypsum board.

.5 Tape and fill joints completely down to floor line.

.6 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.7 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for painting or other thin finish coating.

.8 Sanding not required behind solid finishes and above finished ceilings.

~ END ~