

Long Term Care Homes and Services
City Of Toronto

Interior Projects
Flooring and Handrail Replacement 2022

PROJECT MANUAL

ISSUED FOR TENDER

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ISSUED FOR MLTC REVIEW

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MSA PROJECT NO:

21500.F99_015

MONTGOMERY SISAM ARCHITECTS INC.

ARCHITECTURAL

NO

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DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

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END OF DOCUMENT

1 SUMMARY OF WORK

1.1 Refer to Appendix A - Project Details.

2 ALTERNATIVES

2.1 All alternatives must be submitted with the bid using Appendix SA.

3 PHASING OF THE WORK

3.1 Refer to Appendix A - Project Details.

4 WORK RESTRICTIONS

4.1 Contractor's Use Of Site:

.1 Use of site is limited to immediate areas of work. Areas designated for storage of material and equipment where specific to the project, are to be coordinated with the Owner and Building Services Manager.

.2 Do not unreasonably encumber site with materials or equipment. Move stored products or equipment which interfere with operations of Owner and Building Services Manager, or other Contractors. Obtain and pay for use of off-site additional storage, or work areas as required by the Work.

4.2 Coordination with Occupants:

.1 Coordinate performance and sequencing of the Work with the Owner. Notify the Owner 48 hours in advance of noise-generating activities or interruption of any building services which may disrupt normal operations. Do not interrupt building services without Owner's and Building Services Manager's permission.

4.3 Hours of Work:

.1 Hours of work for this contract are generally confined to 8:00am to 5:00pm Monday to Friday. Where required by sequencing of the Work, or where shutdown of building services is required, portions of the Work may be required to be performed outside of regular daily business hours, or on weekends. All Hours of Work permitted will be subject to approval from the Building Services Manager and will be as identified in the Ministry Of Health Operational Plan for the Work.

4.4 Allowances:

.1 Include all allowances listed below in the Bid Price. Expend Cash Allowances as directed by the Consultant. Each Cash Allowance will be adjusted to actual cost as defined hereunder and Contract Price will be amended accordingly by written order. Progress payments for work and material authorized under Cash Allowances will be made in accordance with the Contract. Cash allowances do not include H.S.T. Contractor to include all overhead and profit mark-ups associated with Material (Supply Only) or Assembly (Supply and Install) Cash Allowances.

.1 Include the following Allowances in the Bid Price:

.1 Amount for the Cash Allowance will be defined in the Bid Sheet.

5 CONTRACT MODIFICATIONS

- .1 Supplemental Instruction: as issued by the Consultant, consistent with the intent of the Contract Documents, and will not involve an adjustment in Contract Price or Contract Time.
- .2 Proposed Change: as issued by the Consultant, will notify the Contractor of an impending or proposed change to the Work, and will require submission of a quotation from the Contractor and all affected Subcontractors for each item noted. Submit quotation within the time period stipulated on the form, and indicate separate line items for labour and materials in each case. Work outlined in a Proposed Change must not proceed without the issuance of a Change Order signed by the Owner.
- .3 Change Order: will be issued by the Consultant upon review and approval of quotations for a Proposed Change, or a Change Directive, and authorizes the Contractor to proceed with the change(s) proposed. A Change Order will amend the Contract Price, and/or the Contract Time.
- .4 Fees For Changes to The Work:
 - .1 The following fees will apply to the Contract Price for changes to the Work and shall include all statutory charges, applicable duties and taxes, charges required by labour agreements in force, charges related to site and/or office overhead, project management and administration, all shop and field supervision, clerical, drafting, bonding costs, permits, associated payroll costs, and other charges incidental to the work including but not limited to handling, equipment warranty, identification, coordination, scheduling, Bill 208 and WHMIS.
 - .2 The Fees For Changes In The Work shall apply only to extras to the Contract. Contractor or Subcontractor mark-up will not be applied to credits.
 - .3 For all Changes to the Work which may be ordered by the Owner, the following maximum net mark-ups for overhead and profit by the Contractor will be permitted for adjustments in Contract Price in accordance with the General Conditions:

Contractor's Mark-up on Work by Own Forces	Contractor's Mark-up on Subcontracted Work
5%	5%

- .4 For all Changes to the Work which may be ordered by the Owner, the following maximum net mark-ups for overhead and profit by Subcontractors will be permitted for adjustments in Contract Price in accordance with the General Conditions:

Contractor's Mark-up on Work by Own Forces	Contractor's Mark-up on Subcontracted Work
5%	5%*

- .5 (*) Aggregate total of overhead and profit for ALL subtrades within the Subcontractor's Contract.

6 APPLICATIONS FOR PAYMENT

6.1 Applications for payment on account may be made monthly as the Work progresses, and shall be preceded by the submission of a Schedule of Values for review by the Consultant.

6.2 The second and all subsequent applications for payment shall include a statement based on the Schedule of Values, a statutory declaration (CCDC 9B), and a standard Workers Compensation Certificate of Clearance.

6.3 Schedule Of Values:

- .1 Complete Schedule of Values must be submitted at the Project Pre-Construction Meeting. For Phased Work, the Schedule of Values shall identify value of the work by Phase and the value of all Phases must be submitted at the Project Pre-Construction Meeting.

- .2 Submit Schedule of Values in spreadsheet form acceptable to the Consultant.

- .3 List items of work as separate line items.

- .4 The values of the Work shall be listed as to the aggregate percentage and dollar value completed, under the following major headings:

- .1 Initial contract amounts for each line item,
- .2 Progress to Date,
- .3 Percent Complete,
- .4 Current Invoice,
- .5 Previous Billings,
- .6 Contract Balance

- .5 Final totals shall identify:

- .1 Total amount
- .2 Holdback deducted
- .3 Holdback released
- .4 Amount invoiced to date
- .5 Net amount
- .6 HST
- .7 Amount due this Certificate

6 PROJECT MANAGEMENT & COORDINATION

6.1 Project Coordination:

- .1 The Contractor is responsible for the overall coordination of the Work. Coordinate the work of all subcontractors, and provide such assistance as is necessary, including but not limited to;

- .1 Providing site dimensions and layout,
- .2 Providing temporary facilities and controls,
- .3 Scheduling subcontractors work to prevent conflicts,
- .4 Scheduling and administering regular subtrade scheduling and coordination meetings throughout progress of the Work.
- .5 Scheduling and administering regular subtrade safety meetings throughout progress of the Work.

.2 The Contractor shall facilitate production of interference drawings where necessary for coordination of the Work. Provide such interference drawings to the Consultant for review.

.3 Coordinate with Owner as required for any Owner supplied and installed items required by this Project. Provide miscellaneous blocking and mounting as required for intended items.

6.2 Project Supervision:

.1 The Contractor shall provide and maintain full-time supervision from their own staff on site. The supervisor shall be responsible for the overall day-to-day coordination on site between subtrades.

.2 The supervisor shall coordinate the work of all subcontractors, and provide such assistance as is necessary.

6.3 Project Meetings:

.1 Schedule and administer regular project progress meetings throughout progress of work. Frequency of meetings as agreed by Owner Consultants and Contractor at start-up meeting. The minimum for progress meeting shall be bi-weekly.

.2 Distribute written notice of each meeting to Owner & Consultants four days in advance of meeting date. Indicate full agenda of coming meeting.

.3 The Contractor shall record minutes. Itemize significant proceedings and decisions. Identify 'action by' appropriate parties. Reproduce and distribute copies of minutes within three days after each meeting and transmit to meeting participants and affected parties not in attendance.

.4 Standard Templates for Minutes of Meeting will be distributed for the Contractors use at the Pre-Construction Meeting.

.5 Contractor to provide Project Contact List within 4 days following the Pre-Construction Meeting. Standard templates for the Contact List will be distributed for the Contractors use at the Pre-Construction Meeting.

6.4 Project Site Administration:

.1 Contractor to maintain at the Jobsite - 1 - 8.5" x 11" Binder containing the following:
.1 Contract Documents.

- .2 Building Permit & all other required permits
- .3 Building Permit Review Documents
- .4 Addenda.
- .5 Reviewed shop drawings.
- .6 Change Orders and other Contract modifications.
- .7 Field test and inspection reports.
- .8 Approved schedules.
- .9 MSDS Sheets and relevant Product Data.
- .10 Contact List.
- .11 Notice of Project.
- .12 All additional items requested as per the Owners Pre-Construction List.

6.5 Construction Progress Schedule:

- .1 Prepare schedule in horizontal chart form, with weekly horizontal time scale identifying first/last work day of each week and separate line for each trade or operation of the Work. Schedule must utilize "critical path" method. Schedule to be MS Project format.
- .2 Project Schedules shall identify all long lead delivery items and shop drawing time requirements.
- .3 Identify projected major milestones in the course of the Work such as completion of foundation work, structure, closing in, major inspections by building officials, Substantial Performance, etc.
- .4 Submit one copy of preliminary Progress Schedule for review at the Project Pre-Construction Meeting. Submit 4 copies of each subsequent issue of schedule to the Consultant. Amend and update schedule on a regular basis or as requested by the Consultant.
- .5 All project Schedules will be reviewed by the Consultant based on the time commitment identified in the RFQ documents.

6.6 Submittal Schedule:

- .1 Provide schedule for submittal of all Shop Drawings, Product Data and Samples at the Project Pre-Construction Meeting.
- .2 Provide complete list of all manufactured products to be used in the course of the Work, including those amended by addenda.

6.7 Additional Documents:

- .1 Consultant may issue additional documents in the form of drawings, specifications, schedules, or written instructions to assist proper execution of the Work. These documents shall take the form of either a Supplemental Instruction or Change Order.

- 6.8 Submittals:
- .1 Submit to Consultant, all items specified for review, at least 10 days before reviewed submissions will be needed, and in orderly sequence so as to not cause delay in the Work. Do not proceed with work affected by the submittal until review is complete.
 - .2 Review all submittals prior to submission to the Consultant. Submittals not stamped, signed, and dated will be returned without review.
 - .3 Verify field measurements and affected adjacent work are coordinated. Contractor's responsibility for errors and omissions in submission, or deviations from requirements of Contract Documents, is not relieved by Consultant's review of submittals.
 - .4 A 2 week standard timeframe is assumed for the preparation and submission of Sample, Shop Drawings, and Product Data. All Samples, Shop Drawings and Product Data which do not meet this criteria must be identified at the project Pre-Construction Meeting.
- 6.9 Submission Requirements:
- .1 Submit 5 copies of all submittals. Submittals by FAX, or as copies of FAX transmissions are not acceptable and will not be reviewed. Shop drawings and product data sheets not submitted in the scale type of the contract documents (ie. metric for metric drawings) will not be reviewed.
 - .2 Accompany submissions with transmittal letter containing date, Project title and number, Contractor's name and address, drawing/page numbers of each shop drawing or data sheet, identification (ie. "structural steel shop dwgs."), and number of copies submitted.
- 6.10 Return of Submissions:
- .1 If no errors are discovered or only minor corrections are made, one copy of the submission will be returned. If shop drawings or data sheets are rejected, noted copy will be returned and resubmission of corrected shop drawings or data sheets through the same procedure indicated above, shall be made.
- 6.11 Distribution of Submittals after Review:
- .1 Distribute copies of shop drawings and product data which carry Consultant's stamp to all affected parties.
- 6.12 Shop Drawings:
- .1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work.

- .2 Adjustments made on shop drawings by the Consultant are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Consultant prior to proceeding with the Work.
- .3 Reproductions of Consultants' drawings are not acceptable for the purpose of creating Shop Drawings.

6.13 Product Data Sheets:

- .1 Manufacturer's standard schematics, catalogue sheets, diagrams, schedules, performance charts, illustrations and other descriptive data are acceptable in lieu of shop drawings, where specified.
- .2 Submit product data sheets or brochures requested in specification Sections, and as the Consultant may reasonably request where shop drawings will not be prepared due to standardized manufacture of product.
- .3 Submit copies of all WHMIS Data Sheets.

6.14 Samples:

- .1 Submit duplicate samples for review, in sizes requested in respective specification sections. Label samples as to origin and intended use in the Work. Where colour, pattern or texture is criteria, submit full range of samples.
- .2 Deliver samples prepaid to Consultant's office.
- .3 Reviewed samples will become standards of work and material against which installed work will be checked on project.

7 CONTRACT ADMINISTRATION

- 7.1 The Contract Administration office functions performed by the Consultant will generally be done through the web based contract administration software "Rform" by Re Form Technologies Ltd. (www.rform.ca).
- 7.2 The Contractor will be required to participate with the balance of the project team by using Rform for the duration of the project. Rform is a free service to the Contractor and does not require the Contractor to pay any setup or usage fees.
- 7.3 The Contractor will be provided with instructions on the access and operation of Rform in the event they are not familiar with it's function or operation. The Contractor's staff involved in the project will be provided with access to Rform at no cost to the Contractor.
- 7.4 Suppliers and Subcontractors will not be provided with access to Rform. The distribution of information issued by the Consultant, and coordination of that information, remains the responsibility of the Contractor.

- 7.5 Rform will be used for issuing electronic project related documents, including Requests for Information, Supplemental Instructions, Proposed Change Orders, Change Orders, Change Directives, Progress Claims, Certificates of Payment, Submittal Reviews, and other forms as may be required. At the discretion of the Consultant, Rform may also be used for the distribution and filing of other project related documents, including but not limited to Field Review Reports, Test Reports, Meeting Minutes, and so on. Rform will also provides automatically generated logs of documents issued within Rform.
- 7.6 The Contractor will be required to print hard copies of all project related documents issued through Rform, and to maintain files of those documents on site at all times.
- 7.7 Notwithstanding that Rform does not require signatures for the issuance and approval of documents, adjustments to the Contract Price and Contract Time in a Change Order shall only be deemed to be agreed to by the Owner and Contractor when executed by hand, and that electronic acceptance does not satisfy the conditions of agreement under GC 6.2.2 of the CCDC2 2008 Stipulated Price Contract.

8 CONSTRUCTION PHOTOGRAPHS

- .1 General:
- .1 Provide construction photographs in accordance with procedures and submission requirements specified in this section.
 - .2 Photographs shall be taken using a digital camera.
 - .3 Photo Print Size: minimum 100 x 150mm.
- .2 Progress Photographs:
- .1 Provide construction photographs, documenting progress of the Work. Submit one digital set, and 2 printed sets, with each monthly progress draw. Maintain one additional printed set on site, in clear plastic photo sleeves bound in 3-ring binder.
 - .2 Submit progress photographs with each monthly progress draw, documenting the following milestones;
 - .3 Completion of excavation and pouring of footings,
 - .4 Completion of foundations prior to backfilling,
 - .5 Completion of structural frame,
 - .6 Completion of rough-in of mechanical and electrical services before concealment.
 - .7 Completion of building veneers.
 - .8 Completion of each interior finish material.
 - .9 Orientation of Photographs: provide photos from at least 2 general viewpoints, as well as specific views as required by milestones specified above, and as determined by Consultant prior to first Progress Draw.
 - .10 Identification: legible identification on 20 x 50mm white label on top left corner of all photographs indicating the following:
 - .1 Project name and number,
 - .2 Orientation,
 - .3 Date of exposure.
 - .11 Printed Photo Finish: matte with binding margin at one long edge.

- .12 Mounting & Binding: Photos shall be mounted in clear plastic sleeves purpose-made for 3-ring binder storage.
- .13 Submit site copy of printed progress photographs with Operations & Maintenance Manuals at the completion of the project.
- .3 Final Photographs:
 - .1 In addition to progress photographs, provide 1 digital set of images, and 2 printed sets, of final photographs of the completed project.
 - .2 Orientation of Photographs: provide final photos as follows:
 - .1 General viewpoints as defined above,
 - .2 Views of all exterior elevations,
 - .3 Views of site showing paved and landscaped surfaces,
 - .4 Interior views of all spaces,
 - .5 Specific views as determined by Consultant .
 - .3 Identification: legible identification on 20 x 50mm white label on top left corner of all photographs indicating the following:
 - .1 Project name and number,
 - .2 Orientation,
 - .3 Date of exposure.
 - .4 Photo Print Finish: matte with binding margin at one long edge.
 - .5 Mounting & Binding: Final photos shall be mounted in clear plastic sleeves purpose-made for 3-ring binder storage.

9 QUALITY CONTROL

9.1 Independent Inspection and Testing:

- .1 Independent Inspection and Testing Consultants will be engaged by the Owner for the purpose of inspecting and/or testing individual portions of the Work. The initial cost of such services will be borne by the Owner, as allocated under Allowances.

9.2 Access To Work:

- .1 Allow inspection & testing companies access to the Work, as well as off site manufacturing and fabrication plants.

9.3 Reports:

- .1 Submit three copies of inspection and test reports to the Consultant.
- .2 Provide copies to Subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested. Submit one copy of inspection and test reports to the Building Official having jurisdiction, where required by that official.
- .3 The cost of tests beyond those called for in the Contract Documents or beyond those required by the law of the Place of Work shall be appraised by the Consultant and may be authorized as recoverable.

9.4 Inspection and Testing - General:

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

9.5 Inspection and Testing - Procedures:

- .1 Notify the appropriate agency and Consultant in advance of the 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 an orderly sequence so as not to cause delay in the Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store, cure and inspect test samples.

9.6 Quality Of The Work:

- .1 Quality of the Work shall be first class, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Consultant if required work is such as to make it impractical to produce required results.
- .2 Do not employ any unfit person or anyone unskilled in their required duties. The Consultant reserves the right to require the dismissal from the site, of workers deemed incompetent, careless, insubordinate or otherwise objectionable.

9.7 Defective Materials and Work:

- .1 Where evidence exists that defective work has occurred, or that work has been carried out incorporating defective products, the Consultant may have independent tests, inspections, or surveys performed in order to determine if work is defective.
- .2 Tests, inspections, or surveys carried out under these circumstances will be made at the Contractor's expense in the event of defective work, or at the Owner's expense where work is in conformance. This does not include re-testing of soil compaction during placement, where evidence exists of non-conformance with the Contract documents, but rather only if re-testing is called for after completion of compaction.

10 **TEMPORARY FACILITIES AND CONSTRUCTION CONTROLS**

- 10.1 Provide temporary utilities, facilities and controls in order to execute the work expeditiously. Remove from site all such work after use.

10.2 Vehicular Access & Parking:

- .1 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractor's use of roads. Maintenance shall include regular snow removal, and regular power washing to remove mud and dirt.
- .2 Where site access for construction vehicles necessitates use of public roads, remove mud and dirt from such roads where contaminated by construction vehicles.
- .3 Traffic Control: Provide and maintain flagpersons, traffic signals, barricades and flares, lights, or lanterns as required to perform the work and protect the public.
- .4 Provide and maintain adequate access to project site.
- .5 Build and maintain temporary access roads where indicated or required, and provide snow removal during period of work.
- .6 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractor's use of roads. Maintenance shall include regular snow removal if not provided under separate contract, and regular power washing to remove mud and dirt.
- .7 Where site access for construction vehicles necessitates use of public roads, remove mud and dirt from such roads where contaminated by construction vehicles.
- .8 Traffic Control: Provide and maintain flag persons, traffic signals, barricades and flares, lights, or lanterns as required to perform the work and protect the public.

10.3 Construction Parking:

- .1 Parking for construction equipment vehicles will be limited to the site or immediate areas of work.
- .2 Parking for Contractors' and Subcontractors' personal vehicles will not be permitted on site unless authorized by the Owner and Building Services Manager.

10.4 Temporary Utilities:

- .1 Temporary Electricity and Lighting:
 - .1 Connect to existing power supply in accordance with Canadian Electrical code.
 - .2 Install temporary facilities for power such as pole line and underground cables to approval of local power supply authority.
 - .3 Electrical power and lighting systems installed under this contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage. Replace lamps which have been used more than a period of 3 months.

- .4 Provide temporary lighting in all areas of construction, to the minimum requirements of the Occupational Health and Safety Act, and minimum requirements specified herein.
 - .2 Temporary Water Supply:
 - .1 Water supply is available in existing building and will be provided for construction usage at no cost.
 - .2 Permanent water supply system installed under this contract can be used for construction requirements provided that guarantees are not affected thereby. Make good damage.
 - .3 Temporary Heating and Ventilating:
 - .1 Provide and maintain all temporary heat and ventilation necessary during construction, including cost of installation, fuel, operation, attendance and maintenance. Use of direct-fired heaters discharging waste products into work areas will not be permitted unless prior approval is given by Consultant.
 - .2 Prevent hazardous accumulation of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .3 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .4 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .5 Ventilate storage spaces containing hazardous or volatile materials.
 - .6 Maintain strict supervision or operation of temporary heating and ventilating equipment.
 - .7 Conform to the requirements of CAN/CSA Z317.2-01 – Special Requirements for Heating Ventilating and Air Conditioning (HVAC) Systems in Health Care Facilities.
 - .4 The permanent HVAC systems of the building, or portions thereof, may not be used for construction purposes.
- 10.5 Construction Facilities:
- .1 Temporary Telephone and Facsimile: Provide and pay for temporary telephone. Cellular telephones are acceptable.
 - .2 Equipment, Tools and Materials Storage:
 - .1 On site storage of materials and equipment is not permitted unless authorized by the Building Services Manager. Provide adequate weathertight enclosures with raised floors, for storage of materials, tools, and equipment which are subject to damage by weather.
 - .2 Temporary enclosures required by subtrades as workshops shall be provided by those trades.
 - .3 Confine the Work and the operations of employees to limits indicated by the Contract Documents. Where on-site storage is authorized, do not unreasonably encumber the premises with Products.
 - .4 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.

- .3 Site Storage and Overloading:
 - .1 Confine the Work and the operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the premises with products.
 - .2 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger the Work.

- .4 Sanitary Facilities:
 - .1 The Owner's existing facilities may not be used. Provide sanitary facilities for work force in accordance with governing regulations and ordinances. Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition. Where portable toilet facilities are provided, empty and sanitize such facilities on a weekly basis, or more frequently if required.
 - .2 Owner's existing facilities may not be used, unless designated by the Building Services Manager. Use only those facilities when so designated. Maintain designated facilities in a clean and sanitary condition while in use by construction workers.
 - .3 Permanent new facilities may not be used.

- 10.6 Construction Safety:
 - .1 Observe all construction safety measures as required by the General Conditions of the Contract, the Occupational Health and Safety Act and Regulations for Construction Projects, and by all authorities having jurisdiction, provided that in case of conflict or discrepancy, the more stringent requirements shall apply.
 - .2 Provide applicable spare safety equipment such as helmets, safety glasses, and harnesses, and enforce their use by Consultants, the Owner, their representatives and any authorized visitors to the site.
 - .3 Provide and maintain fences, gates and locks, covered walkways, guard rails, barriers, night lights, and appropriate warning signage as required for the protection of the public, and of public and private property; as required by the General Conditions of the Contract, the Occupational Health and Safety Act and Regulations for Construction Projects, and by all authorities having jurisdiction. Erect and maintain sturdy railings around shafts, and the like, to protect workmen and the public from injury.
 - .4 Contractors are to provide relevant certifications for all workers and sub-contractors at the pre-construction meeting. Copies shall be kept onsite in the Project Binder.

- 10.7 Workplace Hazardous Materials Information System:
 - .1 Comply with all requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets.
 - .2 Include copies of all WHMIS data sheets in Operations and Maintenance Manuals.

- 10.8 Falsework: Design and construct falsework in accordance with CSA S269.1.
- 10.9 Temporary Barriers & Enclosures:
- .1 Dust Screens:
 - .1 Provide dust tight screens or partitions to localize dust generating activities, and for the protection of workers, finished areas of Work and the public.
 - .2 Dust screens shall consist of, as a minimum, 0.15 mm thick polyethylene sheets secured to appropriate framing and sealed at all joints and at perimeter to prevent migration of dust.
 - .3 Maintain and relocate protection until such work is complete.
 - .2 Temporary Partitions:
 - .1 Provide temporary partitions to separate the work areas from occupied resident areas.
 - .2 Temporary partitions shall consist of 92mm steel studs with 16mm Type X gypsum board both sides. Partitions shall be constructed as fire separations having a 1 hour fire resistance rating. Provide 89mm thick sound attenuation batt insulation.
 - .3 Provide lockable fire-rated hollow metal doors and frames for access to work areas by workers, and to prevent access by resident or unauthorized personnel.
 - .3 Contractor to provide security until dust screens and temporary partitions are erected.
 - .4 Dust Screen and Temporary partitions must be erected to the satisfaction of the Building Services Manager and the Consultant. A Dust Control/Temporary Partition Layout Proposal, must be submitted for review by the Building Services Manager and Consultant prior to the start of the Work.
 - .5 Security:
 - .1 Where security of an existing building has been reduced by the Work, provide temporary means to maintain security. Provide and pay for security service to patrol the site if building cannot be otherwise secured.
 - .2 Adhere to the Owner's policies for security and access to long term care centre.
 - .6 Building Access:
 - .1 Access existing building only at points designated by the Owner.
 - .2 When designated by the Owner, elevators assigned for Contractor's use may be used for moving workers and materials within building. Protect walls of elevators to approval of Consultant before use. Accept liability for damage, safety of equipment and overloading of existing equipment.
 - .7 Site Signs and Notices:
 - .1 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Consultant.

- .2 No other signs or advertisements of any description except notices regarding safety and instruction, shall be put up around the building, or site, without the approval of the Consultant.
- .3 Provide and install all temporary signage as required to direct interior and exterior traffic flows.

10.10 Permits:

- .1 Owner to provide building permit. Contractor shall maintain all permits and provide close-out at project completion.
- .2 Contractor shall obtain and apply for all other permits (including scaffolding, hoist, trailer, temporary buildings etc.) licenses, deposits, and certificates of inspection as part of the Contract Price as per Conditions of the Contract. Ensure that permits, licences, deposits and certificates included under specific Sections are provided as specified.

11 **FIRE SAFETY**

11.1 Fire Fighting Equipment:

- .1 Provide and maintain in working order, ULC labelled, 9kg 4A 60BC type fire extinguishers, and locate in prominent positions to approval of authorities having jurisdiction.

11.2 Fire Department Access:

- .1 Construction activities must not obstruct access routes designated for fire department equipment. If necessary that existing access be obstructed or deleted, alternative access, acceptable to the fire department, must be provided prior to commencement of construction, in accordance with Ontario Building Code location and design criteria for required access routes.

11.3 Control of Combustible Materials:

- .1 The stockpiling of construction materials adjacent to the existing building must be carefully controlled in accordance with the Ontario Fire Code. Materials stored, and their proximity to equipment used in construction, may create a fire hazard. Control of combustibles on a construction site is regulated under the Occupational Health and Safety Act.

11.4 Hot Work And Red Tag Permit Training:

- .1 All Contractors including Sub-Contractors who are involved in this Project shall submit written certificates prior to commencement of work confirming that all staff performing work has successfully completed "Managing Impairments Using FM Global's Red Tag Permit System" and "Managing Hot Work Using FM Global's Hot Work Permit System".

- .2 In order to successfully complete the training, a grade of 80% is required. The contractor and sub-contractor's staff must be re-certified every three years.
- .3 The free online training session can be accessed through <http://training.fmglobal.com>. Each session takes less than one hour to complete and can be accessed 24 hour a day, seven days a week from any computer connected to the Internet.
- .4 Contractor shall coordinate with the City's Project Manager to obtain the login credentials. Authorization will be obtained by the Project Manager by sending an e-mail to onlinetraining@fmglobal.com with the name, company name and e-mail address of the person(s) requiring authorization. Please note that 24 hours is required to allow for confirmation of contractor authorization. Contractor is responsible for coordinating registration of the courses with the City's Project Manager.

12 PRODUCT REQUIREMENTS

12.1 Product Options:

- .1 Provide products specified under individual specification sections. Where Specification lists two or more products, or two or more manufacturers of the same product, the Contractor may select one of the listed products or manufacturers. Confirm selection of products and manufacturers when requested by the Consultant.
- .2 When only one product or manufacturer is listed in the specifications, it is intended that only that product or manufacturer is acceptable.

12.2 Product Substitution Procedures During Construction

- .1 The Contractor shall identify all product substitutions using the Specified Alternatives Form from the Owner prior to closing.
- .2 Products may only be substituted during the Construction period for one or more of the following reasons:
 - .1 Insolvency of the product manufacturer.
 - .2 Inability of the manufacturer to provide the product(s) in the timeframe required to maintain the construction schedule.
 - .3 Product specified has been discontinued.
 - .4 Substitution proposed offers better performance than that specified, at no additional cost.
 - .5 Substitution offers equivalent performance to that specified, at a reduced cost to the Owner (reduction in Contract Price).
- .3 Items 12.2.2.2, and 12.2.2.3 will require a letter from the manufacturer, confirming their inability to provide the products specified, or inability to meet the schedule.
- .4 Items 12.2.2.4, and 12.2.2.5 will be at the discretion of the Owner.

12.3 Availability:

- .1 Immediately upon signing Contract, review Product delivery requirements, and identify lead times for supply of all Products. If lead times in supply of Products may affect the Construction Schedule, notify the Consultant in order that appropriate action may be authorized in ample time to prevent delay in performance of the Work.
- .2 In the event of failure to notify the Consultant at commencement of Work, and should it appear that Work may be delayed for such reason, the Consultant reserves the right to substitute more readily available products of similar character, at no increase in Contract Price.

12.4 Reference Standards:

- .1 Within the specifications, reference standards are identified. Conform to these standards, in whole or part, as specifically requested.
- .2 If there is question as to whether any product or system is in conformance with applicable standards, the Consultant reserves the right to have such products or systems tested to prove or disprove conformance. The cost for such testing will be born by the Contractor.

12.5 Product Transportation & Delivery:

- .1 Transportation and delivery costs of Products required in the performance of the Work, are included in the Contract Price.
- .2 Products must be appropriately crated, skidded, boxed, shrink-wrapped, or otherwise packaged to protect such products from damage during shipment. Products which arrive at the site in a damaged condition must be rejected and returned to the supplier/manufacturer for immediate replacement.

12.6 Product Storage, Handling and Protection:

- .1 Handle and store Products in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions.
- .2 Store packaged or bundled Products in original and undamaged condition with manufacturer's seal 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 Store sheet materials and lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .5 Remove and replace damaged Products at own expense and to the satisfaction of the Consultant.

12.7 Manufacturer's Instructions:

- .1 Unless otherwise indicated in the specifications, install or erect Products in accordance with manufacturer's printed instructions. Do not rely on labels or enclosures provided with Products. Obtain written instructions directly from manufacturers.
- .2 Notify Consultant in writing, of conflicts between the specifications and manufacturer's instructions, so that Consultant may establish correct course of action.
- .3 Improper installation or erection of Products, due to failure in complying with these requirements, authorizes the Consultant to require removal, replacement where necessary, and re-installation at no increase in Contract Price.

12.8 Fastenings:

- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Space anchors within limits of load limit or shear capacity and ensure that they provide positive permanent anchorage. Wood or any other organic material plugs are not acceptable.
- .3 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .4 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

12.9 Quality Of Materials:

- .1 Products, materials, equipment and articles (referred to as Products throughout the specifications) incorporated in the Work shall be new, not damaged or defective, and of the best quality (compatible with specifications) for the purpose intended. If requested, furnish evidence as to type, source and quality of Products provided.
- .2 Defective products, whenever identified prior to the completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is a precaution against oversight or error. Remove and replace defective Products at own expense and be responsible for delays and expenses caused by rejection.
- .3 Should any dispute arise as to the quality or fitness of Products, the Consultant may request additional testing based upon the requirements of the Contract Documents, to confirm acceptability of products or materials.
- .4 Unless otherwise indicated in the specifications, maintain uniformity of manufacture for any particular or like item throughout the building.

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- .5 Permanent labels, trademarks and nameplates on Products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.
- 12.10 Defective Materials and Work:
- .1 Where evidence exists that defective work has occurred, or that work has been carried out incorporating defective products, the Consultant may have independent tests, inspections, or surveys performed in order to determine if work is defective.
- .2 Tests, inspections, or surveys carried out under these circumstances will be made at the Contractor's expense in the event of defective work, or at the Owner's expense where work is in conformance. Where tests incorporate a number of samples, payment will be assessed, by the Consultant, based on the ratio of conforming to non-conforming results. This does not include re-testing of soil compaction during placement, where evidence exists of non-conformance with the Contract documents, but rather only if re-testing is called for after completion of compaction.
- 12.11 Warranties & Guarantees:
- .1 Warrant all products and labour forming part of the Work for two (2) years except where individual sections identify greater warranty requirements.
- .2 Warrant products and assemblies for the specified periods of time where in excess of the Contract Warranty, as specified within their respective sections.
- .3 Guarantee aspects of the Work for the specified periods of time where in excess of the Contract Warranty, as specified within their respective sections.
- .4 Warranties and Guarantees shall commence at Date of Substantial Performance of the Contract as certified by the Consultant.
- .5 Warranties and Guarantees shall be original copies, printed on company letterhead, or on a standard company warranty certificate, bearing the name of the company.
- .6 Warranties and Guarantees shall indicate:
- .1 Name of the Principal (the Manufacturer/Subcontractor),
 - .2 Name of the Obligee (the Owner),
 - .3 Name and address of Project,
 - .4 Commencement date (Date of Substantial Performance),
 - .5 Duration of warranty or guarantee,
 - .6 Clear statement of what is included, and what if any exclusions there are, and
 - .7 Signature of Principal's representative having signing authority.

13 EXECUTION REQUIREMENTS

13.1 Examination

.1 Acceptance of Conditions:

- .1 The General Contractor shall examine all existing or pre-determined conditions, prior to commencing work in that area, and report to the Consultant all conditions unacceptable for work to proceed. Commencement of work shall imply acceptance of conditions as is.
- .2 Subcontractors shall examine all existing or pre-determined conditions affecting their portion of the Work, prior to commencing such work, and report to the Contractor all conditions unacceptable for work to proceed. Commencement of work shall imply acceptance of conditions as is.

13.2 Preparation:

.1 Field Engineering:

- .1 Locate, confirm and protect control points prior to starting the Work. Preserve permanent reference points during construction.
- .2 Establish reference lines and elevations. Locate and lay out by instrumentation.

.2 Survey Requirements:

- .1 A certified land survey prepared by a Registered Ontario Land Surveyor (OLSA member), acceptable to Owner, will be required under the following circumstances:
 - .1 Where the Work is an entirely new building,
 - .2 Where the Work is an addition to be constructed up to site setback line(s), as legislated by municipality, or
 - .3 Where the Work is a long term care centre or addition thereto.
- .2 Establish two new permanent bench marks on site, referenced to existing bench mark(s) by survey control points. Record locations, with horizontal and vertical data for inclusion in Operations and Maintenance Manual.

.3 Records:

- .1 Maintain a complete, accurate log of control points and survey work as work progresses.
- .2 On completion of foundations and major site improvements, prepare certified survey showing dimensions, locations, angles and elevations of foundation work.

13.3 Cutting and Patching:

.1 Submit a written request in advance, for approval of cutting or alteration which affects:

- .1 Structural integrity of any element of Project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of any operational element.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of Owner or separate contractor.

- .2 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
 - .3 After uncovering, inspect conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.
 - .4 Perform cutting, fitting and patching, including excavation and fill, to complete the Work. Perform work to avoid damage to other work.
 - .5 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
 - .6 Cut rigid materials using power saw or core drill. Pneumatic or impact tools not allowed.
 - .7 Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. At penetration of fire-rated wall, ceiling, or floor construction, completely seal voids with fire stopping material, full thickness of construction element. Refer to 'Firestops and Smoke Seals Section' where provided. Maintain Fire Separation to code as required at no additional cost to the Owner.
 - .8 Refinish surfaces to match adjacent finishes; for continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit to the satisfaction of the Consultant at no additional cost to the Owner.
 - .9 Provide all openings greater than 200mm in non-structural elements of work for penetrations of mechanical and electrical work. Divisions 21, 22, 23 and 26 shall provide all sleeves and locations for sleeves. The cost of all cutting and patching required by Divisions 21, 22, 23 and 26 shall be paid for by those trades.
 - .10 Ensure that all cutting and patching work, including that paid for under Divisions 21, 22, 23 and 26, is properly performed by the respective trades skilled in that line of work. Restore work with new products in accordance with Contract Documents.
- 13.4 Location Of Equipment and Fixtures:
- .1 Location of mechanical and electrical equipment, fixtures and devices indicated or specified, are to be considered as approximate. Final location of such items will be determined on site, based on integration with structural and architectural elements, and as required by coordination with other trades. In the event of a conflict, final determination of location of these items rests with the Consultant at no additional cost to the Owner.
 - .2 Prepare and submit for review by the Consultant, interference field drawings, to indicate relative position of various services and equipment, at the following locations as a minimum:
 - .1 Under all rooftop mechanical units.
 - .2 At locations of all major ductwork, piping, and conduit crossovers.
 - .3 Where ductwork passes under major structural elements.

- .3 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .4 Request a review of items by Consultant once rough-in is underway, prior to final installation, and obtain approval for actual locations.

13.5 Concealment:

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

13.6 Lighting Fixtures at Suspended Ceilings:

- .1 Ensure that secure support is provided for lighting fixtures by suspended ceilings, or by separate hangers, or by both.
- .2 Coordinate the ceiling system and lighting fixture installations to provide adequate support.
- .3 Submit affidavits with acceptable design information confirming that the installation of the suspended ceiling system and/or separate fixture hangers will provide adequate support for the lighting fixtures without exceeding specified deflection tolerances for the ceiling system.
- .4 Conform to current requirements of the Electrical Safety Authority (ESA).

13.7 Existing Services:

- .1 Where work involves the interruption of, or connection to existing services, carry out such work as directed by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.
- .2 All interruption or shut down of Building Systems must be fully coordinated with the Consultant and Building Services Manager.
- .3 Before commencing work, establish location and extent of service lines in area of work and notify Consultant of findings.
- .4 Submit schedule to, and obtain approval from Consultant for any shutdown or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .5 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .6 Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.
- .7 Remove abandoned service lines to distance of 1200 mm from foundations. Cap or otherwise seal lines at cut-off points as directed by Consultant.

- .8 Record locations of maintained, re-routed and abandoned service lines.
- 13.8 Alterations, or Additions to Existing Building:
 - .1 Execute work with least possible interference or disturbance to occupants, public and normal use of premises. Arrange with Owner to facilitate execution of work.
 - .2 Interruptions to building services shall require a minimum of 72 hours written notice to the Owner. Obtain Owner's approval before interrupting any building service.
- 13.9 Protection Of Work In Progress:
 - .1 Adequately protect Work completed or in progress. Work damaged or defaced due to failure in providing such protection is to be removed and replaced, or repaired, as directed by the Consultant, at no increase in Contract Price.
 - .2 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 Consultant.
 - .3 Protect finished surfaces with overlays of protective materials such as Kraft paper, cardboard, or plywood, as required for individual applications to provide adequate protection.
- 14 CLEANING & WASTE MANAGEMENT**
- 14.1 Conduct cleaning and disposal operations to comply with local ordinances and environmental protection legislation.
- 14.2 Store volatile wastes in covered metal containers, and remove from premises at end of each working day.
- 14.3 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- 14.4 No Mixing of Materials in open areas used by Building Occupants.
- 14.5 Area for Mixing of Materials to be determined by the Consultant and Building Services manager
- 14.6 Failure to maintain site cleanliness to the satisfaction of the Building Services Manager and the Consultants will result in cleaning performed by the owner and charged to the Contractor. (for both general cleaning and final cleaning).
- 14.7 All cleaning materials used(for both general cleaning and final cleaning) to be reviewed and approved for use by the Consultant and Building Services Manager.
- 14.8 Cleaning During Construction:
 - .1 Maintain the Work in tidy condition, free from accumulation of waste products and debris, other than that caused by the Owner or other Contractors.

- .2 Remove waste material and debris from the work areas and deposit in waste container at the end of each working day.
- .3 Vacuum clean interior areas prior to start of finishing work. Maintain areas free of dust and other contaminants during finishing operations.
- .4 Individual Subcontractors are responsible for the daily clean-up and removal of debris related to, or generated by, their own work. The overall responsibility for project cleanliness rests with the Contractor.

14.9 Waste Management:

- .1 Audit, separate and dispose of construction waste generated by new construction or by demolition of existing structures in whole or in part, in accordance with Ontario Regulations 102/94 and 103/94 made under the Environmental Protection Act.
- .2 Fires, and burning of rubbish or waste on site is prohibited.
- .3 Burying of rubbish or waste materials, except as specified herein, is prohibited.
- .4 Disposal of waste or volatile materials such as mineral spirits, oil, gasoline or paint thinner into ground, waterways, or sewer systems is prohibited.
- .5 Empty waste containers on a regular basis to prevent contamination of site and adjacent properties by wind-blown dust or debris.

14.10 Final Cleaning Operations:

- .1 Immediately following Date of Substantial Performance, and prior to Owner occupancy of the building or portion of the building affected by the Work, conduct full and complete final cleaning operations.
- .2 Final cleaning operations shall be performed by an experienced professional cleaning company, possessing equipment and personnel sufficient to perform full building cleaning operations.
- .3 Remove all surplus products, tools, construction machinery and equipment not required for the performance of remaining work, and thereafter remove any remaining materials, equipment, waste and debris.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .6 Cleaning operations shall include the removal of all stains, spots, scuff marks, dirt, dust, remaining labels, adhesives or other surface imperfections.
- .7 Remove all paint spots or overspray from all affected surfaces.

- .8 Vacuum, clean and dust behind grilles, louvres and screens.
- .9 Broom clean and spray wash all exterior paved surfaces.
- .10 Remove dirt and other disfiguration from exterior surfaces.
- .11 Clean all areaways, drywells, and drainage systems.
- .12 Clean all equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment.

15 PROJECT CLOSE-OUT PROCEDURES

15.1 Inspection and Declaration:

- .1 Arrange for, conduct and document final inspections, close-out and commissioning at the completion of the Work in accordance with procedures described in the General Conditions of CCDC2-2008, and OAA/OGCA Document 100.

15.2 Substantial Performance:

.1 Contractor's Inspection:

- .1 Refer to OAA/OGCA Document 100 - STAGE 2.
- .2 When the Contractor has carried out the steps in Stage 2 of OAA/OGCA Document 100, and has determined that the requirements of the Contract have been substantially performed as defined by local Lien legislation, the Contractor shall make application for Substantial Performance of the Work.
- .3 In addition to the requirements of OAA/OGCA Document 100, the following items shall accompany the Contractor's application for Substantial Performance. These items must be submitted and reviewed and complete in all respects, and all verification certificates and reports having been submitted and approved by the Consultants prior to issuing Substantial Completion:
 - .1 Completed Maintenance Manuals for all disciplines (No. of copies as specified),
 - .2 As-Built Drawings for all disciplines (No. of copies as specified),
 - .3 Occupancy Permit (where required by Municipality),
 - .4 Air Balance Report (legible technicians worksheets are acceptable),
 - .5 Gas fired appliances inspection,
 - .6 Plumbing Inspection,
 - .7 Domestic Water Quality Test Report,
 - .8 Sprinkler dry test verification letter stamped and signed by sprinkler design Engineer,
 - .9 Mechanical start-up reports (Boilers, HVAC Units, Chillers, Water Softeners, etc.),
 - .10 Fire Alarm verification (include legible technicians worksheets),
 - .11 Emergency Lighting verification,
 - .12 ESA Certificate,
 - .13 Systems operations have been demonstrated to Owner's personnel.

- .4 The Contractor and all Subcontractors shall conduct an inspection of the work, identify deficiencies and defects, and make corrections as required to conform with the Contract Documents. Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made. Request a Consultant's Inspection.
- .2 Consultant's Inspection: The Consultants shall perform an inspection of the Work to assess the validity of the Contractors application, and shall identify in separate lists, unfinished work and deficiencies. Contractor shall correct work accordingly.
- .3 Substantial Performance of the Work:
 - .1 Refer to OAA/OGCA Document 100 - STAGE 4.
 - .2 Should the Consultant concur with the Contractor's application for Substantial Performance, the Consultant shall notify the Contractor of approval of the application for Substantial Performance and issue a Certificate of Substantial Performance.
 - .3 The Contractor shall publish a copy of the Certificate of Substantial Performance in a construction trade newspaper, and shall provide the Consultant with proof of the date of publication.
- .4 Lien Period And Release Of Basic Holdback:
 - .1 Refer to OAA/OGCA Document 100 – STAGE 5.
 - .2 Commencement of Lien and Warranty Periods
 - .1 The day following the date of publication of Certificate of Substantial Performance shall be the date of commencement of the Warranty Period, and of the 45 day Lien Period prior to release of basic holdback, unless required otherwise by lien statute of the Place of the Work.
 - .2 When the Contractor has carried out the required steps in Stages 3 and 4 of OAA/OGCA Document 100, the Contractor shall make application for Release of Basic Holdback.
 - .3 The Consultant shall prepare the Certificate for Payment for release of basic holdback, and promptly upon receipt of the necessary documentation, issue the Certificate for Payment to the Owner.
- .5 Final Inspection and Payment:
 - .1 Refer to OAA/OGCA Document 100 - STAGE 6.
 - .2 Submit a signed statement stating following have been performed:
 - .1 Work has been reviewed for compliance with Contract Documents,
 - .2 All deficiencies have been corrected and unfinished work have been completed,
 - .3 Work is complete and ready for Final Inspection.
 - .3 When items noted above are completed, a final inspection of the Work will be performed by the Owner, the Consultants, and the Contractor.
 - .4 If the Work is deemed to be incomplete, complete outstanding items and request a reinspection.
 - .5 If the Work is deemed to be complete, the Consultant will issue a Final Certificate for Payment.

- .6 Deficiency Review:
 - .1 Following the issuance of the Certificate of Substantial Performance and prior to the Contractor's application for Final Payment and release of any monies retained as "Finishing Holdback", the Contractor shall continue to complete unfinished work and correct deficiencies. At the request of the Contractor, the Consultants shall conduct up to two general deficiency reviews during this period.
 - .2 The first review will be undertaken only if the Contractor has inspected the Work, and states in writing that the unfinished work noted in their application for Substantial Performance has been completed, and at least 50% of all deficiencies have been corrected.
 - .3 The second review will be undertaken only if the Contractor has inspected the Work, and states in writing that at least 90% of the deficiencies have been corrected.
 - .4 If the Consultants determine during either review that the above noted criteria for progress have not been met, they may terminate the deficiency review.

- .7 Reinspection:
 - .1 Should reinspection by Consultant be required due to failure of work to comply with Contract Documents, the Owner will deduct amount of Consultant's compensation for reinspection services from monies owed to the Contractor.

16 CLOSE-OUT SUBMITTALS

- 16.1 Quality:
 - .1 Spare parts, maintenance materials and special tools provided shall be new, not damaged or defective, and of the same quality and manufacture as products provided in the Work.
 - .2 If requested, furnish evidence as to type, source and quality of Products provided.
 - .3 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

- 16.2 Delivery, Storage, and Handling:
 - .1 Deliver all materials required as maintenance materials, spare parts or special tools, to the site, include shipping costs, and store as directed.
 - .2 Store spare parts, maintenance materials and special tools in a manner to prevent damage, or deterioration.
 - .3 Store in original and undamaged containers with manufacturer's seals or labels intact.
 - .4 Store materials subject to damage from severe climatic changes in a climate-controlled, weatherproof enclosure.
 - .5 Store paints and freezable materials in a moderately heated and ventilated room.

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- 16.3 Maintenance Materials, Spare Parts & Tools
- .1 Provide spare parts in quantities specified in individual specification sections. Provide identical items to those installed in the Work.
 - .2 Provide maintenance materials in quantities specified in individual specification sections. Provide identical items of same manufacturer, dye lot or production run as items in the Work.
 - .3 Provide special tools in quantities specified in individual specification sections, and tag items identifying their function and equipment or products to which they are associated.
 - .4 Receive and catalogue all items. Check inventory and include approved listings in Operations and Maintenance Manual.
 - .5 Obtain receipts for delivered products and submit prior to Substantial Performance.
- 16.4 Operations and Maintenance Manual:
- .1 Prepare Operations and Maintenance Manual during the course of construction and have completed prior to Date of Substantial Performance.
 - .2 Maintain one copy of the Operation and Maintenance Manual volume(s) for periodic review and comment, as requested by the Consultant during the course of construction.
 - .3 Submit two digital copies of the Operation and Maintenance Manual volume(s) as either a PDF or Microsoft Word document with the application for Substantial Performance in accordance with OAA/OGCA Document 100.
 - .4 Provide table of contents and index tab sheets for each volume. Itemize and tabulate contents.
 - .5 Group drawings as to content, and index for quick reference.
 - .6 Operation and Maintenance Manual shall contain, as a minimum, the following information:
 - .1 Project contact list including after hours/emergency contact numbers
 - .2 All contract documents including tender calls, addendums, contract and change orders
 - .3 Contact information, including after-hours/emergency contact numbers, for maintenance and repairs
 - .4 Warranty and guarantee certificates
 - .5 Equipment start-up and troubleshooting instructions
 - .6 Equipment schematics & diagrams
 - .7 Catalogue of all maintenance materials and quantities
 - .8 Maintenance data
 - .9 All shop drawings

- .10 Before and after photographs organized such that the before and after photographs of any one are positioned adjacent to each other for easy reference.

16.5 As-Built Drawings:

- .1 Record information on a clean set of black line opaque drawings, provided by Owner.
- .2 Maintain as-built drawings on site and update as construction progresses. Allow periodic review by Consultant as requested.
- .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.

16.6 Record Drawings:

- .1 Upon attaining Substantial Performance completion of the Work, obtain base CAD drawings, from the Consultant. The electronic files will be in AutoCad Version 2000. Update the AutoCad drawings to include as-built conditions.
- .2 Submit electronic files to the Consultant for review. Any subsequent changes found by the Consultant shall remain the responsibility of the Contractor at no charge to the Owner.

END OF SECTION

Electronic Files Transfer Agreement

Architect of Record ("The Consultant"):
Contractor ("The Contractor"):
Re ("The Owner"):

Montgomery Sisam Architects

City of Toronto Long Term Care

The Contractor hereby acknowledges requesting from the Consultant, electronic data containing the graphic (electronic) representation of the Architectural Drawings as per attached list of drawings, subject to the condition that the said drawings are to be used only for information and reference in connection with the Owner's use and occupancy of the Project. The Contractor shall be responsible for checking and verifying all dimensions, details, and quantities of materials and for the coordination of related elements as required to facilitate complete and accurate fabrication and installation. Any omissions or discrepancies shall be reported to the Consultant.

The Contractor hereby warrants to the Consultant that the files will be used solely for the development of shop drawings. The drawings shall not be used for any other purpose on this project and shall not be used on any other project either by the Contractor or by others. The Contractor further warrants not to alter the electronic data or the information contained therein, in any way except for the above-noted purposes, and acknowledges that such unauthorized use or alteration of the original work is protected in accordance with the Copyright Act and

Consultant, and its sub-consultants from all claims, damages, losses, expenses, penalties and liabilities of any kind, including attorney's fees, arising out of, or resulting from the use of the electronic files by the Contractor, or by third party recipients of the electronic files from the Contractor.

The Consultant believes that no licensing or copyright fees are due to others on account of the transfer of the electronic files, but to the extent any are, the Contractor will pay the appropriate fees and hold the Consultant harmless from such claims.

Any purchase order number provided by the Contractor is for Contractor's accounting purposes only. Purchase order terms and conditions are void and are not a part of this agreement.

The laws of the Province of Ontario shall govern this agreement.

The conditions and undertakings expressed herein apply to partners, employees, agents, successors, assigns and legal or other representatives of the Contractor.

subject to the penalties prescribed therein.

The Contractor hereby acknowledges that the said electronic data contain information which may be updated or altered at any time by the Consultant, and that it is the responsibility of the Contractor to make themselves aware of these changes, in a timely manner. In the event of a conflict between the drawings issued to the Contractor and the sealed contract drawings, the sealed contract drawings shall govern.

The Contractor agrees to pay the Consultant \$100.00 per file, plus any and all applicable taxes. The fees are to cover the costs of preparation of the electronic data, and disbursements related to the preparation and shipment/forwarding of the electronic data only.

By paying the fees, the Contractor has in no way purchased the drawings or any rights to the drawings or the information contained therein, and the Contractor may only alter the drawings for the purposes noted above.

The Contractor shall, to the fullest extent permitted by law, indemnify, defend and hold harmless the

AUTHORIZED ACCEPTANCE

By Consultant

Signature

Print Name and Title

Date _____

By Contractor

Signature

Print Name and Title
(Authorized Signing Officer)

Date _____

APPENDIX SA – SUGGESTED ALTERNATIVES

Bidder: _____

The following Suggested Alternatives are **NOT INCLUDED** in the Bid price.

Individual Suggested Alternatives may be discarded or incorporated into the Final Contract Price at the discretion of the Owner.

Provide the appropriate data for comparison showing conformance to specified standards, dimensions, fabrication, colour, quality assurance, warranty, execution etc. as necessary for the Consultant to confirm the Suggested Alternative meets or exceeds the specifications. At the time of this submittal, provide the Consultant with the relevant Architectural details which prove conformance with the design intent and co-ordination with and installation by affected trades.

Suggested Alternative Prices **DO NOT INCLUDE** H.S.T.

Suggested Alternatives identified on this form are for Divisions 1 to Division 26 inclusive. We submit a proposal to substitute for:

specified in Section _____ of the Specifications, the following alternative:

The Suggested Alternative is submitted for the following reason:

We ensure that a comparison has been made of all specified characteristics, that the Suggested Alternative does not alter the intent of the Drawings and Specifications and we hereunder tabulate significant variations which lessen the performance characteristics and quality of materials, increase the weights and / or dimensions, and substitute different materials for those specified.

The effect on the stipulated price is (choose one):

ADDITION (\$ _____) DEDUCTION (\$ _____)

(Submit a separate sheet for each item)

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for demolition and removals Work in accordance with the Contract Documents.
- .2 Work included: Requirements for demolishing, salvaging and removing wholly or in part the various items designated on the drawings or required to be removed or partially removed for the receipt of the Work of this Contract, including not necessarily limited to:
 - .1 Alteration and renovations to existing building.
 - .2 Cutting and removing of walls, floors, ceilings, doors and frames , in the existing buildings as indicated.
 - .3 Patching, making good openings and chases in walls, floors, ceilings, including the supply and installation of lintels, channels and finishes.
 - .4 Removal of rubbish, debris, demolished fixtures, fitments and items not scheduled to remain the Owner's property, resulting from the demolition and preparatory work.
 - .5 Remove abandoned services such as conduits, pipes, wiring, ducts, fixtures, equipment, etc. where required for the work or indicated on the drawings.
 - .6 Removal of all mechanical items including plumbing fixtures, services etc. where required for the work or indicated on drawings and or where not required to be relocated.
 - .7 Removal of existing electrical items including fixtures, etc. where required for the work or indicated on the drawings and not required to be relocated.
 - .8 Removal and disposal of existing flooring, existing wall base, and all other related products impacted by the work.
 - .9 Removal of moveable furniture, fixed furniture and equipment as required for a complete installation.
 - .10 Drywall repair and replacement as indicated.
 - .11 Dust control during the operations of the work of this Section.
 - .12 Removal shall mean removal from site and safe disposal in a legal manner.

1.2 REFERENCES

- .1 CSA S350-M, Code of Practice for Safety in Demolition of Structures.

1.3 SUBMITTALS

- .1 Where required by Authorities having jurisdiction, submit a Fire Plan to local fire department for review and approval.
- .2 Submit shop drawings, diagrams and details in accordance with Section 01 00 00.
- .3 Submit for approval, a plan showing impacts, interruptions and delays to Owners operations.

- .4 Submit Dust Control Plan conforming to requirements of the City of Toronto's Public Health Services.
- .5 Submit to Consultant, details of where rubble, debris and other materials are to be disposed or reused. Include each disposal/reuse site location, operator's name and business address, type of license under which site operates, and criteria used by site to assess suitability of rubble, debris and other materials for disposal.
- .6 Give notice to Utility Authorities controlling services and appurtenances which will be affected by demolition Work.

1.4 QUALITY ASSURANCE

- .1 Prepare waste audits, waste reduction workplans, source separation programs and recycling programs as required by jurisdictional authorities and update programs and implement such programs as required.
- .2 Perform the work of this section in accordance with the 'Environmental Protection Act' including Ontario Regulation 102 and the 'Environmental Assessment Act' including Ontario Regulation 103.
- .3 Conform to Fire Code, Regulation under the Fire Marshals Act.
- .4 The demolition contractor must engage a registered professional engineer who holds a certificate of authorization and an appropriate level of liability insurance to prepare demolition procedures.
- .5 As part of the contract requirements, the engineer for the demolition contractor should be required to sign the general review commitment required by city building departments.

1.5 SITE CONDITIONS

- .1 Interruptions to Owners operations will not be permitted.
- .2 Perform operations, machine and equipment movements, deliveries and removals at time or times that will permit uninterrupted operations in and around structures, including parking, deliveries, and Site access and egress.
- .3 Take over structures to be demolished based on condition on date that Tenders close.

2 Products

2.1 MATERIALS

- .1 All materials requiring removal shall become the Contractor's property and shall be removed and disposed of from the site, as the work progresses, unless indicated otherwise.
- .2 Salvaged material: Salvage and stockpile original materials as indicated on site or indicated on drawings. Salvaged materials shall not be chipped, cracked, split, stained or damaged. Store items off of moist surfaces.

3 Execution

3.1 GENERAL

- .1 Clean up rubble and debris, resulting from Work promptly and dispose at end of day or place in waste disposal bins. Empty bins on regular basis.
- .2 Stockpiling of rubble, debris, and surplus Products on Site will not be permitted.
- .3 Remove, handle and transport Products indicated to be salvaged and stored for future use. Transport Products to storage area(s) designated by Consultant. Perform Work to prevent any damage to Products during removal and in storage. Products damaged during removal, will be inspected by Consultant. Consultant will determine extent of damage and accept or refuse Products.
- .4 Communicate Dust Control Plan procedures to all appropriate personnel on site and their head offices and due diligence measures to be maintained to control all fugitive emissions.
- .5 Take precautions to guard against movement, settlement or collapse of adjacent services, sidewalks, driveways, or trees. Be liable for such movement, settlement or collapse caused by failure to take necessary precautions. Repair promptly such damage when ordered.

3.2 EXAMINATION

- .1 Examine adjacent structures and other installations prior to commencement of demolition and removals Work in accordance with Authorities having Jurisdiction.

3.3 PRESERVATION OF REFERENCES

- .1 Record location and designation of survey markers and monuments located within demolition area, prior to removal. Store and restore markers and monuments upon completion of Work or relocate as directed by Consultant.

3.4 PROTECTION

- .1 Provide, erect and maintain required hoarding, sidewalk sheds, catch platforms, lights and other protection around Site before commencing work. Maintain such areas free of snow, ice, mud, water and debris. Lighting levels shall be equal to that prior to erection.
- .2 Prevent movement or damage of adjacent parts of existing structure to remain. Supply and install bracing, and shoring as required. Make good damage caused by demolition to acceptance of Consultant.
- .3 Protect adjacent structures and property against damage which might occur from falling debris or other causes. Repair or replace damage caused from Work of this Section to acceptance of Consultant.
- .4 Do not interfere with use of adjacent structures and Work areas. Maintain free, safe passage to and from adjacent structures and Work areas.
- .5 Take precautions to support affected structures. If safety of structure being demolished, adjacent structures or services are endangered, cease demolition operations and take necessary action to support endangered item. Immediately inform Consultant. Do not resume demolition until reasons for endangering have been determined and corrected and action taken to prevent further endangering.
- .6 Hang tarpaulins where debris and other materials are lowered. Build in around openings with wood and plywood at locations used for removal of debris and materials.
- .7 Prevent debris from blocking surface drainage system, elevators, mechanical, and electrical systems which are required to remain in operation.
- .8 Pay particular attention to prevention of fire and elimination of fire hazards which would endanger Work or adjacent structures and premises.
- .9 Supply and install adequate protection for materials to be re-used, set on ground and prevent moisture pick-up. Cover stockpiles of materials with tarpaulins.
- .10 Close off access to areas where demolition is proceeding by barricades and post warning signs.
- .11 Supply, install and maintain legal and necessary barricades, guards, railings, lights, warning signs, security personnel and other safety measures, and fully protect persons and property.

- .12 Dust/weather partitions:
 - .1 Prior to demolition Work proceeding in existing structures, temporarily enclose Work areas, access and supply and install dustproof and weatherproof partitions. Design partitions to prevent dust and dirt infiltration into adjoining areas, prevent ingress of water, and to resist loads due to wind.
 - .2 Prevent dust, dirt and water from demolition operations entering operational areas.
 - .3 Adjust and relocate partitions as required for various operations of Work.
 - .4 Upon completion of Work, remove and dispose of partitions from Site.

- .13 Dust protection:
 - .1 Perform dust control procedures in accordance with approved Dust Control Plan and work of this Section.
 - .2 Clean water to be applied to hard and soft surfaces and on open excavation faces on Site daily to eliminate dust.
 - .3 Roadways and sidewalks to be cleaned daily or as required.
 - .4 A designated truck loading area on granular material or existing asphalt to be used to mitigate tracking of potentially contaminated soil and demolition debris off Site. Contaminated loading points to be cleaned or re-established.
 - .5 Loaded vehicles leaving Site to be cleaned of loose soil and debris with power washing or alternative method.
 - .6 Trucks loaded with indigenous soil or demolition debris to be covered by tarps or attached screens.

- .14 Blasting is not permitted.

3.5 PREPARATION

- .1 Disconnect and/or re-route electrical data, communication and telephone service lines entering structures to be demolished. Remove abandoned lines as indicated on Contract Drawings. Post warning signs on electrical lines and equipment which is required to remain energized.

- .2 Disconnect and cap designated mechanical services:
 - .1 Natural gas supply lines: As indicated on drawings, to be removed by qualified workers in accordance with gas company instructions.
 - .2 Sewer and water lines: Remove and dispose of as indicated on Contract Drawings.
 - .3 Other underground services: Remove and dispose of as indicated on Contract Drawings.

- .3 Disassemble and remove mechanical equipment, ductwork and piping complete with supports and associated components.

- .4 Do not disrupt active or energized utilities designated to remain undisturbed.

- .5 Perform rodent and vermin control to comply with health regulations.

3.6 DEMOLITION

- .1 Perform demolition with extreme care. Confine effects of demolition to those parts which are to be demolished.
- .2 Perform Work and prevent inconvenience to persons outside those parts which are to be demolished.
- .3 Carry out demolition in accordance with the requirements of CSA S350-M.
- .4 Demolish parts of structure to permit remedial Work as indicated.
- .5 Do not overload floor or wall with accumulations of material or debris or by other loads.
- .6 Perform Work to minimize dusting. Keep Work area wetted down with fog sprays to prevent dust and dirt rising. Supply and install temporary water lines and connections that may be required. Upon completion, remove installed temporary water lines. Use covered chutes, water down.
- .7 Do not sell or burn materials on Site.
- .8 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as Work progresses.
- .9 At end of day's Work, leave Work in safe condition with no part in danger of toppling or falling.
- .10 Drainage and sewer system protection:
 - .1 Ensure that no dust, debris or slurry enters drainage and sewer system on Site.
 - .2 Remove and dispose of debris and slurry promptly from Site.
 - .3 Comply with City of Toronto Sewer Use By-Law.
12. Remove interior partitions, fittings, fixtures and accessories as indicated on drawings. Partitions and walls shall be removed full height to structure above.
13. Remove interior finishes, such as ceiling, wall, and floor finishes, where new finishes are indicated on the Finish Schedule and Drawings.
 1. Removal of existing ceilings shall include complete removal including bulkheads and suspension system.
 2. Removal of adhesive applied finishes shall include complete removal to substrate including adhesive. Take adequate care to prevent damage to substrate.
- .14 Remove existing floor finishes, include mortar bed, adhesives, underlayment or other cleavage membranes, underpad, base, floor moulding and transition strips.

15. Demolish all other items indicated or required.

3.7 DISPOSAL OF MATERIALS

- .1 Remove from Site, rubble, debris, and other materials resulting from demolition and removals Work in accordance with Authorities having Jurisdiction, except where specified or indicated on Contract Drawings to be reused.
- .2 Conform to requirements of municipality's Works Department regarding disposal of waste materials.
- .3 Materials prohibited from municipality waste management facilities shall be removed from Site and dispose of at recycling companies specializing in recyclable materials.

3.8 RESTORATION

- .1 Where demolition removed a structure or installation, rough grade and restore area in accordance with Authorities having Jurisdiction.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for topping Work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM C109M, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens).

1.3 **SUBMITTALS**

- .1 Product data:
- .1 Submit duplicate copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard(s), characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 00 00 indicating:
 - .1 Sections, details, materials, dimensions, thicknesses of each layer, maximum and minimum thicknesses, 3, 7, and 28 day load characteristics, and surface finishes.
 - .3 Certificates: Submit certification from manufacturer, stating that materials proposed for use are compatible with specified floor finishes.

1.4 **QUALITY ASSURANCE**

- .1 Installers qualifications: Perform Work of this Section by a company that has a minimum of five years proven experience in installations of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator's current certificate of approval by the material manufacturer as proof of compliance.

1.5 **SITE CONDITIONS**

- .1 Do not install Work of this Section outside of following environmental ranges without Consultant's and Product manufacturer's written acceptance:
- .1 Concrete temperature: 10°C minimum.
 - .2 Ambient air temperature: 16°C to 30°C.
 - .3 Precipitation: None.

- .2 Supply and install temporary protection and facilities to maintain Product manufacturer's, and above specified environmental requirements for 48 hours before, during, and 48 hours after installation.

2 Products

2.1 **MATERIALS**

- .1 Concrete based levelling compound:
 - .1 Compressive strength to ASTM C109, 28 day 4100 psi.
 - .2 Flexural strength to ASTM C109: 28 day 1000 psi.
 - .3 Primer: Type as recommended by topping manufacturer to suit intended condition.
 - .4 Acceptable material: 'Ardex K-15' by Ardex Engineered Cements or approved alternative.
- .2 Water: potable.

2.2 **MIXES**

- .1 Mix toppings in accordance with manufacturer's written instructions.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 **PREPARATION**

- .1 Remove loose, spalled, cracked, eroded and disintegrated concrete to solid surface.
- .2 Verify substrate surfaces are solid, free from surface water, frozen matter, dust, oil, grease, scaling or laitance, projections and any other foreign matter detrimental to performance.
- .3 Prohibit traffic on prepared areas until Work of this Section is completed.
- .4 Supply and install temporary protection to adjacent surfaces, floor drains, and steel angles to prevent damage resulting from Work of this Section.
- .5 Prior to application of topping, remove all debris by vacuuming.

3.3 INSTALLATION

- .1 Install topping in accordance with reviewed shop drawings and manufacturer's written instructions.
- .2 Let cure in accordance with manufacturer's, recommendations.

3.4 PROTECTION

- .1 Provide temporary protection for surfaces subjected to concentrated loads before they have cured sufficiently to carry them without damage.
- .2 Prevent traffic over completed areas, and protect Work of this Section from precipitation, freezing, and debris after final installation.

END OF SECTION

-
- 1 General
- 1.1 **SECTION INCLUDES**
- .1 Labour, Products, equipment and services necessary for masonry patching and infill work in accordance with the Contract Documents.
- 1.2 **REFERENCES**
- .1 ASTM C207, Specification for Hydrated Lime for Masonry Purposes.
- .2 CSA A165 Series, CSA Standards on Concrete Masonry Units.
- .3 CSA A179, Mortar and Grout for Unit Masonry.
- .4 CSA A370-M, Connectors for Masonry.
- .5 CSA A371-M, Masonry Construction for Buildings.
- .6 CAN/CSA A3001, Cementitious Materials for use in Concrete.
- .7 CSA S304, Design of Masonry Structures.
- 1.3 **SUBMITTALS**
- .1 Shop drawings:
- .1.1 Submit shop drawings in accordance with Section 01 00 00 indicating.
- .1.2 Interfacing with existing masonry and details, anchors, special detailing, patterning and locations of control joints.
- .2 Samples:
- .2.1 Submit samples in accordance with Section Section 01 00 00:
- .2.2 Submit samples of each type and colour of masonry unit to match existing prior to placing order.
- .2.3 Submit samples of masonry anchors, and ties.
- .3 Quality control submittals: Submit manufacturer's certificates stating that materials supplied are in accordance with this Specification.
- 1.4 **QUALITY ASSURANCE**
- .1 Provide plain and reinforced masonry in accordance with CSA A370-M, CSA A371-M, and CSA S304.
- 1.5 **DELIVERY, STORAGE, AND HANDLING**
- .1 Deliver, store and handle Products in accordance with the Conditions of the Contract and as specified herein.

- .2 Remove unacceptable materials from Site and replace to acceptance of Consultant. Store materials off ground protected from wetting by rain, snow or ground water, or inter-mixture with earth or other materials.
- .3 Do not concentrate storage of materials on any part of structure beyond design load, take particular care not to overload unsupported portions of structure which may have not attained their full design strength.
- .4 Comply with CSA A371-M.
- .5 Deliver mortar materials in original unbroken and undamaged packages with the maker's name and brand distinctly marked thereon. Prevent damage to units.
- .6 Keep masonry materials free from ice and frost. Keep units protected from concrete, mortar and other materials which could cause staining.

2 Products

2.1 **MASONRY UNITS**

- .1 Concrete block units: Normal weight units, CSA A165 Series in thickness to match existing assembly, classifications as follows:
 - .1 H/15/A/M.
 - .2 S/15/A/M.
 - .3 Sc/15/A/M.
- .2 Burned clay brick: Ontario Size; as manufactured by Meridian Brick or approved alternative. Brick type and colour as selected by Consultant to match approved sample.
- .3 Special shapes: Unless indicated otherwise, supply and install corner returns, bull-nosed or double bull-nosed units for exposed and external corners, bond beams, sash blocks for control joints, solid block where noted, concrete block lintels over openings in concrete block walls and any additional special shapes as indicated.
- .4 Obtain each masonry unit type from same manufacturer. Supply and install units of uniform texture and colour for each kind required.
- .5 Supply masonry units with exposed surfaces free of cracks, chips, blemishes, and broken corners.

2.2 **ACCESSORIES**

- .1 Loose steel lintels and lateral support angles: Supplied as part of work of Section 05 50 00.
- .2 Compressible filler: 75 x 6 mm thick preformed, polyurethane foam; 25V by Emseal Joint Systems Ltd.

2.3 MORTAR MATERIALS

- .1 Interior non-loadbearing masonry: CSA A179, Type N, proportion method.
- .2 Cement: CAN/CSA A3001, normal Portland.
- .3 Hydrated lime: ASTM C207, Type S.
- .4 Masonry sand: CSA A179.
- .5 Water: Clean potable, free from deleterious elements and free from salts that can cause efflorescence.
- .6 Concrete fill and grout: 20 Mpa concrete in accordance with CSA A179.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 WORKMANSHIP

- .1 Perform masonry work in accordance with CSA A371-M and as indicated .
- .2 Supply and install masonry work plumb, level and true to line, with vertical joints in alignment and horizontal courses level, uniform, and straight.
- .3 Install masonry work to a plane flatness and exposed end tolerance of 3 mm in 2400 mm.
- .4 Variation in Alignment from Unit to Adjacent Unit: 1.5 mm maximum.
- .5 Variation of Mortar Joint Thickness: 3 mm every metre.

3.3 MASONRY - GENERAL INSTALLATION

- .1 Construct masonry work as required by jurisdictional authorities.
- .2 Before commencing masonry work, verify required limitations for wall heights, wall thicknesses, openings, bond, anchorage, lateral support, and compressive strengths of masonry units and mortars.
- .3 Construct masonry fire protection and fire separations of the thickness indicated on Drawings for the fire resistant ratings as noted on Drawings, and conforming to the Fire-Performance Ratings, Appendix 'D' to the National Building Code of Canada.

- .4 Fire Separations and Fire Separations with Fire Resistance Ratings: Construct walls tightly to construction above and at perimeter, and without openings or voids. Do not reduce the thickness of walls to less than the thickness indicated on the Drawings or for the required fire resistance rating where required.
- .5 Do not butter corner units, throw mortar droppings into joints, or excessively furrow bed joints. Do not shift or tap units after mortar has taken initial set. If adjustment is necessary after mortar has started to set, remove and replace with fresh mortar.
- .6 Do not use admixtures without Consultant's written acceptance.
- .7 Tool mortar joints slightly concave with non-staining tools unless indicated otherwise. Strike joints flush in non exposed areas or where shown on Contract Drawings. Use sufficient force to press mortar tight against masonry units on both sides of joints. Remove excess, remaining mortar material and burrs.
- .8 Cut masonry units with a wet saw to obtain straight, clean, even, unchipped edges. Cut units as required to fit adjoining work neatly or for flush mounted electrical outlets, grilles, pipes, conduit, leaving 3 mm maximum clearance. Use full-size units without cutting wherever possible.
- .9 Reinforce joint corners and intersections with strap anchors 400 mm o.c.
- .10 Do not place reinforcement across masonry wythes at control joints.
- .11 Install masonry with 10 mm thick joints unless indicated otherwise. Make vertical and horizontal joints equal and of uniform thickness.
- .12 Build control joints in masonry walls at intervals and in locations shown. Form joints for block walls using sash block units in accordance with details shown. Fill chase and joint with joint filler full height of control joints. Leave a depth of 13 mm for sealing unless otherwise shown.
- .13 Supply and install solid block or metal lath under block, and fill block cells solid for lintel bearing and as required to secure built-in anchor bolts and/or anchors shown.
- .14 Do not tooth intersections of walls except as otherwise indicated.
- .15 Coordinate installation of masonry with installation of air barrier and vapour retarder to ensure continuity of these systems.

3.4 MORTAR MIXING

- .1 Thoroughly mix mortar ingredients in proper quantities needed for immediate use to requirements of CSA A179.
- .2 Measure and batch mortar materials either by volume or weight, to accurately control and maintain proportions. Do not measure materials by shovel.

- .3 Mix mortar with maximum amount of water consistent with workability for maximum tensile bond strength within capacity of mortar.
- .4 Do not use mortar which has begun to set. Use mortar within 2 hours after initial mixing. Re-temper mortar during 2 hour period only as required to restore workability.
- .5 Add admixtures to requirements of manufacturer's instructions.
- .6 Provide uniformity of mix.

3.5 **PATCHING**

- .1 Lay masonry in pattern to match existing except as indicated otherwise.
- .2 Install a full bed of mortar for first courses of masonry, for masonry units 100 mm thick and less, and between solid units.
- .3 Install special shaped and sized concrete block units as indicated and as required for a complete and coordinated assembly and to minimize cut units.
- .4 Supply and install two courses of solid block beneath lintel bearing.
- .5 Stagger end joints in every course. Align joints plumb over each other in every other course.
- .6 Bond intersecting block walls in alternate courses. Where block work abuts concrete, anchor each block course to concrete.

3.6 **LINTELS**

- .1 Install loose steel lintels, as indicated in Contract Drawings. Centre over opening width.

3.7 **INSTALLATION TOLERANCES**

- .1 Planes true to within 3 mm under 3 m straightedge.
- .2 Plumb within 6 mm in 3 m, or in 6 mm in 6 m at external corners, expansion joints, or other conspicuous lines.
- .3 Level within 6 mm in any bay or 6 m maximum distance, and 12 mm in 12 m or more.
- .4 Located from position shown, and from related position of columns, walls, and partitions within 12 mm in any bay or 6 m maximum distance, and 19 mm in 12 m or more.
- .5 Opening sizes within 6 mm of designated dimension.

- .6 Column and wall cross-section dimensions within minus 6 mm and plus 12 mm.
- .7 With joints to dimensions indicated, but in no case greater than 12 mm.

3.8 REPAIR AND POINTING

- .1 Remove and replace masonry units which are loose, chipped, broken, cracked, marked, stained, discoloured, or otherwise damaged. Supply and install new units to match adjoining units and install in fresh mortar, and point to eliminate evidence of replacement.
- .2 During tooling of joints, enlarge any cracks, holes, or other defects, point and completely fill with mortar.
- .3 Point-up joints including corners, openings and adjacent Work for a neat, uniform appearance, properly prepared for application of sealant compounds.

3.9 CLEANING

- .1 Obtain and follow unit masonry manufacturer's written instructions for cleaning of masonry.
- .2 Clean exposed, masonry surfaces, removing excess mortar as work progresses. Allow mortar droppings to partially dry then dry brush with a stiff fibre brush.

END OF SECTION

1 General

1.1 SECTION INCLUDES

.1 Design, labour, Products, equipment and services necessary for the miscellaneous and metal fabrication work in accordance with the Contract Documents.

1.2 REFERENCES

- .1 ASTM A123, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron & Steel Products.
- .2 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .3 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- .4 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
- .5 CISC/CPMA 1.73a, A Quick-Drying One-Coat Paint for Use on Structural Steel.
- .6 CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.
- .7 CAN/CSA S16.1-M, Limit States Design of Steel Structures.
- .8 CSA S136.1-M, Commentary on CAN/CSA S136-M, Cold Formed Steel Structural Members.
- .9 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
- .10 CSA W48, Filler Metal and Allied Materials for Metal Arc Welding.
- .11 CSA W59-M, Welded Steel Construction (Metal Arc Welding).
- .12 CAN/CSA W117.2-M, Safety in Welding, Cutting and Allied Processes.
- .13 CGSB 85-GP-16M, Painting Galvanized Steel.
- .14 Steel Structures Painting Council (SSPC), Steel Structures Painting Manual, Vol. 2.

1.3 DESIGN REQUIREMENTS

.1 Design details and connections, where not shown on Drawings, in accordance with CAN/CSA-S16.1 and CSA S136.1.

1.4 SUBMITTALS

- .1 Shop drawings:
 - .1 Submit shop drawings for fabrication and erection of miscellaneous and metal items in accordance with Section 01 00 00 indicating:
 - .1 Materials, core thicknesses, class of finish (AMP 555), connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
 - .2 Ensure shop drawings are of one uniform size and based on field measurements.

1.5 QUALITY ASSURANCE

- .1 Retain a Professional Engineer, licensed in the Province of Ontario, with experience in Work of comparable complexity and scope, to perform the following services as part of the Work of this Section:
 - .1 Design handrail modification work and metal fabrication items that are required to resist live, dead, lateral, wind, or seismic loads.
 - .2 Review, stamp, date and sign shop drawings.
- .2 Workmanship: Fabricate Work of this Section to meet the required class of workmanship indicated below in accordance with AMP 555, Section 8.
 - .1 Class 1: for use on direct exposed to view fabricated items:
 - .1 Exposed surfaces are finished smooth with pits, mill marks, nicks, burrs, sharp edges, and scratches filled or ground off. Defects should not show when painted, polished, or finished.
 - .2 Welds should be concealed where possible. Exposed welds are ground to small radius with uniform sized cove unless otherwise noted.
 - .3 Distortions should not be visible to the eye.
 - .4 Exposed joints are fitted to a hairline finish.
- .3 Execute welding by firms certified in accordance with CSA W47.1 Division 1 or 2.1. Ensure welding operators are licensed per CSA W47.1 for types of welding required by Work.

2 Products

2.1 MATERIALS

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, primers and paints are to have low VOC content limits.
 - .2 Unless detailed or specified herein, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.
 - .3 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of Work of this Section.

- .4 Incorporate only metals that are free from defects which impair strength or durability, or which are visible. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharp defined profiles.
- .2 Structural shapes, plates, and similar items: CAN/CSA-G40.20/G40.21-M, Grade 350W. Hollow structural sections: CAN/CSA-G40.20/G40.21-M, Grade 350W, Class H.
- .3 Galvanized sheet steel: ASTM A653/A653M Grade A, Z275 Commercial Quality zinc coating, size and shape as shown.
- .4 Welding materials: CSA W48 and CSA W59-M.
- .5 Fasteners:
 - .1 Conforming to ASTM A307, Grade A, in areas not exposed to view, use unfinished bolts with hexagon heads and nuts. In areas exposed to view, use bolts, nuts, washers, rivets, lock washers, anchor bolts, machine screws and machine bolts Z275 zinc coated in accordance with ASTM A653/A653M. Supply bolts of lengths required to suit thickness of material being joined, but not projecting more than 6 mm beyond nut, without the use of washers.
 - .2 Provide Type 304 stainless steel countersunk fasteners where indicated.
- .6 Primer paint: CPMA 1.73a.
- .7 Galvanized primer paint: Inorganic zinc rich primer. For use on galvanized fabrications where touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.
- .8 Drilled inserts: Mega by ITW Construction Products or HSL by Hilti Inc. heavy-duty anchors, sizes as shown.

2.2 FABRICATION

- .1 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.
- .2 Fit and assemble Work in shop where possible. Execute Work in accordance with details and reviewed shop drawings.
- .3 Use self-tapping shake-proof screws on items requiring assembly by screws or as indicated. Use screws for interior metal work unless otherwise found acceptable by the Consultant.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .5 Execute shop welding to requirements specified.

- .6 Carefully make and fit details. Take special care with exposed finished Work to produce a neat and correct appearance to the Consultant's acceptance.
- .7 Assemble members without twists or open joints.
- .8 Correctly size holes for connecting Work of other trades where such can be determined prior to fabrication. Where possible, show holes on shop drawings. Place holes not to cause appreciable reduction in strength of member.
- .9 Draw mechanical joints to hairline tightness and seal countersunk screw and access holes for locking screws with metal filler where these occur on exposed surfaces.

2.3 FABRICATED ITEMS

- .1 Refer to Drawings for details of metal fabrication work and related items not specifically listed in this Section.
- .2 Where work is required to be built into work of other Sections supply such members to respective Sections.
- .3 Provide metal fabrication items indicated below and items not indicated to be supplied under other Sections. The following items includes miscellaneous and metal fabrication including but not limited to the items listed below.
- .4 Handrail: Remove existing handrail as shown. Install new handrail as shown.
- .5 Miscellaneous steel plates, channels, brackets, supports and angles:
 - .1 Supply and install or supply for installation by trades responsible, all loose steel plates, channels, brackets, supports and angles where indicated, except where such brackets, supports and angles are specified under work of other Sections.
 - .2 Drill for countersunk screws, expansion anchors and anchor bolts.
 - .3 Unless otherwise specified, prime paint.

2.4 ANCHORS AND FASTENING

- .1 Use weld studs of size not larger than 10 mm for attaching miscellaneous materials and equipment to building steel. If weight of item requires larger fasteners use clips or brackets and secure by welding or through bolting.
- .2 Use self drilling expansion type concrete anchors for attaching to masonry and concrete
- .3 Do not secure items to steel deck.
- .4 Use steel beam clamps of two bolt design to transmit load to beam web. Do not use C and I clamps.

2.5 WELDING

- .1 Perform welding by electric arc process.
- .2 Execute welding to avoid damage or distortion to Work. Execute welding in accordance with following standards:
 - .1 CSA W48 - for Electrodes. If rods are used, only coated rods are allowed.
 - .2 CSA W59-M and CSA W59S1-M for design of connections and workmanship.
 - .3 CAN/CSA W117.2-M - for safety.
- .3 Thoroughly clean welded joints and expose steel for a sufficient distance to perform welding operations. Finish welds smooth. Supply continuous and ground welds which will be exposed to view and finish paint.
- .4 Test welds for conformance and remove Work not meeting specified standards and replace to Consultant's acceptance.

2.6 SHOP PAINTING

- .1 Clean steel to SSPC SP6 and remove loose mill scale, weld flux and splatter.
- .2 Shop prime steel with one coat of primer paint to dry film thickness of 0.07 mm. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 deg C. Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature, and humidity conditions.
- .3 Shop prime galvanized steel in accordance with CGSB 85-GP-16M.
- .4 Clean but do not paint surfaces being welded in field.
- .5 Do not paint surfaces embedded in concrete, but clean as if they were to be primed.
- .6 Do not prime steel to be fireproofed or to receive intumescent paint coating.
- .7 Do not prime machine finished surfaces, but apply an effective anti-rust compound.
- .8 Take precautions to avoid damage to adjacent surfaces.

2.7 HOT DIP GALVANIZING

- .1 After fabrication, hot dip galvanize specific miscellaneous steel items as indicated. After galvanizing, plug relief vents air tight with appropriate aluminum plugs as suitable and required for intended metal fabricated item. Straighten shapes and assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with zinc rich primer in accordance with manufacturer's printed directions.

- .2 Hot-dip galvanize members in accordance with requirements of the following ASTM, with minimum coating weights or thicknesses as follows:
 - .1 Rolled, pressed and forged steel shapes, plates, bars and strips: ASTM A123; average weight of zinc coating per square/metre of actual surface, for 4.8 mm and less thickness members 600 g/m² for 6 mm and heavier members 640 g/m².
 - .2 Iron and steel hardware: ASTM A153; minimum weight of zinc coating, in ounces per square foot of surface, in accordance with ASTM A153, Table 1 for the various classes of materials used in the Work.

3 Execution

3.1 **EXAMINATION**

- .1 Examine previously installed Work, upon which this Section depends, verify dimensions and condition of existing Work, and coordinate repairs, alterations, and rectification if necessary. Commencement of Work of this Section is deemed to signify acceptance of existing, prior conditions.
- .2 Obtain Consultant's written approval prior to field cutting or altering of structural members.

3.2 **ERECTION**

- .1 Install metal fabrications in accordance with reviewed shop drawings and manufacturer's written instructions.
- .2 Fit joints and intersecting members accurately. Make Work in true planes with adequate fastenings. Build and erect Work plumb, true, square, straight, level and accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.
- .3 Perform drilling of concrete and steel as required to fasten Work of this Section.

3.3 **TOUCH UPS**

- .1 Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up shop primer damaged during transit and installation, with primer to match shop primer.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for rough carpentry Work in accordance with the Contract Documents.

1.2 REFERENCES

- .1 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .2 ASTM A325, Specification for Bolts Quenched/Tempered Steel Nominal Thread Diameter M16 - M36 For Structural Steel Joints.
- .3 ASTM A653, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .4 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- .5 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.
- .6 CAN/CSA O80 Series M, Wood Preservation.
- .7 CSA O121-M, Douglas Fir Plywood.
- .8 CAN/CSA O141, Softwood Lumber.
- .9 CWC, Canadian Wood Council, Wood Reference Book.
- .10 NLGA, Standard Grading Rules for Canadian Lumber, National Lumber Grades Authority

1.3 QUALITY ASSURANCE

- .1 Lumber identification: Grade stamp of an agency certified by the Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: Grade mark in accordance with applicable CSA standards.
- .3 Lumber quality: Carefully select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing or making proper connections.
- .4 Moisture Content of wood at time of construction shall be 19% maximum.
- .5 Each piece of pressure treated lumber and fire retardant treated lumber shall be shop marked with the pressure treatment brand and ULC monogram respectively, in accordance with CAN/CSA O80-M.

- .6 Dimensions of lumber shall conform to dressed sizes specified in CAN/CSA-0141 unless actual dimensions are otherwise indicated or specified.
- .7 Dimensional references to lumber on Drawings and in Specifications are to nominal sizes unless actual dimensions are indicated. Such actual dimensions shall be dry size.
- .8 Lumber defects: Discard wood with defects which will render a piece unable to serve its intended function. Lumber will be rejected by Consultant for excessive warp, twist, bow, crook, mildew, fungus, or mould, as well as for improper cutting and fitting, whether or not it has been installed.

1.4 ENVIRONMENTAL REQUIREMENTS

- .1 When it is required that wood maintain dimensional stability and tolerances to ensure accurate installation of later work, store and install it only in dry areas, and where no further installation of moist materials is contemplated.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- .1 Store materials in a dry area. Cover materials with tarpaulins or polyethylene sheets to prevent moisture absorption and impairment of structural and aesthetic properties. Vent to allow air movement. Tie covering to keep in place.

2 Products

2.1 MATERIALS

- .1 General: All materials under Work of this Section, including but not limited to, adhesives are to have low VOC content limits.
- .2 Lumber: Softwood, G4S, moisture content 19% or less at time of installation, in accordance with the following:
 - .1 Lumber shall be of same species and grade, equally seasoned and shall be processed and stamped at same mill.
 - .2 CSA O141 and NLGA Standard Grading Rules for Canadian Lumber.
 - .3 Board quality: Construction or better.
 - .4 Dimension quality:
 - .1 Structural joists, planks, and framing: No. 1 Select Structural.
 - .2 Light framing: Construction.
- .3 Plywood: CSA O121-M, G1S unsanded, T & G, standard construction, laminated with waterproof adhesive, interior grade, Thickness as indicated on drawings.
- .4 Surface applied wood preservative: Green coloured copper naphthenate or 5% pentachlorophenol solution, water repellent preservative or same copper-based preservative as used for shop impregnation, in accordance with CAN/CSA O80.

- .5 Fire retardant treatment of lumber and plywood (interior and protected locations): 'Dricon FRT' fire retardant treatment by Biewer Lumber or approved alternative, conforming to ASTM E84, to provide a flame spread rating of 25 or less.
- .6 Rough hardware: Conforming to ASTM F1667; Nails, bolts, screws, anchors, expansion shields, and other fastenings required to frame and fix rough carpentry as follows:
 - .1 Nails, spikes and staples: Spiral type.
 - .2 Bolts: ASTM A325; 12.7 mm diameter minimum with nuts and washers unless noted otherwise.
 - .3 Screws: Countersunk head, full thread type.
 - .4 Proprietary fasteners: Toggle bolts, expansion shields, lag bolts, screws, inorganic fibre plugs, recommended for purpose by manufacturer.
 - .5 Galvanize rough hardware used in fire treated wood and hardware exposed to the atmosphere.
- .7 Fasteners for use in pressure treated wood: Provide hot dipped galvanized fasteners complying to ASTM A153 and connectors in accordance with ASTM A653, Class G185 for non-structural members. Provide type 304 or 316 stainless steel fasteners and connectors for use in Structural, pressure treated wood.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 GENERAL

- .1 Lay out work carefully and to accommodate work of others. Cut and fit accurately: erect in position indicated by Drawings.
- .2 Install rough carpentry to allow for expansion and contraction of the materials.
- .3 Cut work into lengths as long as practicable and with square ends. Align, level, square, plumb, and secure work permanently in place. Brace work temporarily as required. Join work only over solid backing.
- .4 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolthead and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of Work.
- .5 Provide anchors, bolts, and inserts required for attachment of the work of this Section, to those performing the work of other Sections and who are responsible for their installation.

- .6 Do not attach work by wood plugs or blocking in concrete or masonry. Use lead shields, expansion shields, or similar methods only as approved by Consultant.

3.3 MISCELLANEOUS WOODWORK

- .1 Fit and install wood furring, strapping, grounds and blocking. Adequately size, correctly place and conceal members for finishes, fitments and for Work under other Sections. Do not assume that Drawings show required work exactly or completely. Anchor wood members securely in place.
- .2 Install rough bucks, nailing strips and linings to rough openings as required for backing for frames and other Work.
- .3 Except where steel supports are specifically shown, provide wood blocking and supports in metal stud partitions for fastening of item such as casework and other wall mounted accessories. Have respective trades approve the location of such wood blocking.
- .4 Bolt wood blocking or nailing strips to steel framing.
- .5 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .6 Use fire retardant lumber for blocking/framing in ceiling\ spaces, partitions and bulkheads.

3.4 BACKBOARDS

- .1 Install plywood backboards, primed and painted white on both sides, with fire retardant paint.
- .2 Use minimum 19 mm thick plywood on 19 x 38 mm furring around perimeter and at maximum 300 mm intermediate spacing.

3.5 FASTENERS

- .1 Frame, anchor, fasten, tie and brace members for required strength and rigidity.
- .2 Countersink bolts and bolt heads as required for clearance of other Work.
- .3 Size fasteners to penetrate base member by half of fastener length minimum. Minimize splitting of wood members by staggering nails in direction of grain.
- .4 For plywood use spiral, annular or resin coated nails and staples.

3.6 SURFACE-APPLIED WOOD PRESERVATIVE

- .1 Treat raw surfaces, drilled holes and cut ends of pressure treated wood with 2 coats of wood preservative immediately after cutting.

- .2 Apply preservative by dipping, by brush or by pouring into plugged holes to completely saturate surface.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products equipment and services necessary for the finish carpentry work in accordance with the Contract Documents.

1.2 REFERENCES

- .1 ANSI A208.1, Particleboard.
- .2 ANSI/NEMA LD 3, High-Pressure Decorative Laminates.
- .3 APA - The Engineered Wood Association.
- .4 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.
- .5 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
- .6 Architectural Woodwork Standards (AWS) - Quality Standards for Architectural Woodwork.
- .7 CAN/CSA O141, Softwood Lumber.
- .8 CSA O151-M, Canadian Softwood Plywood.
- .9 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber.

1.3 SUBMITTALS

- .1 Shop drawings: Submit shop drawings of finish carpentry work in accordance with Section 01 00 00 indicating materials, thicknesses, sizes, finishes, wood species, grades, profiles, connection attachments, shop jointing, field jointing, reinforcing, anchorage, fastener types and sizes, location of exposed fastenings, mechanical and electrical service routes, service outlets, cutout locations, and sizes. Include erection drawings, plans, elevations, sections, and details as applicable.
- .2 Samples: Submit samples of the following in accordance with the requirements of Section 01 00 00:
- .1 Two of each colour, pattern, gloss, and texture of plastic laminate, in manufacturer's standard tag size.
- .2 Two samples of laminated plastic joints, edging, cutouts and postformed profiles.
- .3 Two of each solid surface, in 100 x 75 x 12 mm samples.
- .4 Two samples of melamine surfaced board, edging and postformed profiles.
- .5 One of each item of finish carpentry hardware.

1.4 QUALITY ASSURANCE

- .1 Execute work of this Section by member of AWMAC, with 5 years experience in finish carpentry Work of comparable complexity and scope. Submit proof of experience upon Consultant's request.
- .2 Fabricate finish carpentry work in accordance with AWS Quality Standards, Premium Quality materials and installation unless otherwise indicated. Perform work in accordance with the definition of Good Workmanship as defined in the AWS Quality Standards.
- .3 Remove and replace finish carpentry Work which does not conform to the AWS Quality standards or as amended by these Specifications.
- .4 Mock-up:
 - .1 Shop fabricate one mock-up of a base cabinet, wall cabinet, and counter top for each type of surfacing specified, complete with hardware and shop applied finishes, installed in location acceptable to Consultant.
 - .2 Shop fabricate one mock-up of a medial records cart, complete with hardware and shop applied finishes, installed in location acceptable to Consultant.
 - .3 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with Work.
 - .4 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle finish carpentry in accordance with the AWS Quality Standards. Control the temperature and humidity in accordance with the AWS recommendations, before, during, and after finish carpentry delivery, and also during storage and installation.
- .2 Cover finished plastic laminated work with heavy kraft paper or put in cartons during shipment. Protect installed surfaces by approved means. Do not remove until immediately before final inspection.

1.6 EXTENDED WARRANTY

- .1 Submit an extended warranty for plastic laminate work of this Section in accordance with General Conditions, except that warranty period is extended to 2 years from date of Substantial Performance of the Work.
 - .1 Warrant against defects in material and workmanship including but not limited to opening of joints, cracking, shrinkage, warpage, and delamination of plastic laminate.
 - .2 Coverage: Complete replacement including affected adjacent Work.

2 Products

2.1 MATERIALS

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, adhesives and mastics, are to have low VOC content limits.
 - .2 Adhesives - Urea-formaldehyde-free glues.
- .2 Concealed framing lumber and plywood:
 - .1 Eastern Spruce, Balsam Fir, or Jack Pine, to CAN/CSA O141, NLGA, and AWS Custom Grade, S4S, average moisture content 7% +/- 2% at installation.
 - .2 Softwood plywood: CSA O151-M; 19 mm unless indicated otherwise, (G2S).
- .3 Veneer core plywood (substrate): APA plywood, Grade A-D, in sizes, thickness and shapes as indicated.
- .4 Plastic laminate: Provide plastic laminates conforming to ANSI/NEMA LD 3 as follows:
 - .1 Flatwork face sheet: 1.2 mm thick, heavy wear resistance.
 - .2 Vertical interior face sheets: 0.8 mm thick.
 - .3 Postformed face sheet: 0.8 mm thick.
 - .4 Backing sheet: thickness to match face sheet, high pressure laminate, manufactured by same manufacturer as face sheet.
 - .5 Plastic laminate: As manufactured by Arborite, Formica, Forbo, Nevamar, Pionite and Wilsonart.
 - .6 Colours: Colours/patterns to match existing.
- .5 Melamine surfaced particleboard: ANSI A208.1, Grade M2 particleboard with a melamine impregnated decorative paper thermofused onto the surface. Edging to be done in 3 mm thick PVC to match melamine colour. 'Panval Thermofused Melamine Panels' by Uniboard Canada Inc. or approved alternative. Colours: White unless indicated otherwise by Consultant.
- .6 Solid surfacing:
 - .1 12 mm thick sheet stock, provide with bullnose edge and all cutouts as required. 'Corian' solid surfacing by DuPont or approved alternative in colour selected by Consultant.
 - .2 Installation and seam adhesives to be as recommended by solid surfacing manufacturer, colour matched to solid surfacing.
- .7 Laminating adhesive: CSA O112 Series, water resistant type, low VOC content, selected by laminate manufacturer for intended end use.
- .8 Fire retardant treatment: In accordance with Section 06 10 00.
- .9 Draw bolts and splines: Type as recommended by fabricator.
- .10 Rubber base: ASTM F1861, 'Mandalay' by Tarkett or approved alternative, size and type as indicated on drawings. Colour: As selected by Consultant.

- .11 Nails and staples: Conforming to ASTM F1667; Size and type to suit application, galvanized for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.
- .12 Bolts, nuts, washers, blind fasteners, lags and screws: Size and type to suit application. Stapling is not acceptable.
- .13 Adhesive and bituminous mastic: Selected by the millwork fabricator with low VOC content.
- .14 Miscellaneous metals: In accordance with Section 05 50 00.
- .15 Upholstery materials:
 - .1 Fabric: Greenguard certified, non-pvc silicone fabric with minimum 100,000 double rubs. Type and colour to be selected by the Consultant.
 - .2 Foam padding: Foam with a indentation force deflection of 24 to 30 kg/m³ (minimum 2.0 lbs per ft³) and meeting code requirements for flammability.
 - .3 Acceptable product and manufacturer: Silica by Momentum or approved alternative

2.2 HARDWARE

- .1 The following hardware is the minimum quality standard for the work of this Section. Alternatives may be considered provided they are approved by Consultant prior to ordering of products.
- .2 Drawer slides: Full extension, 8400 Series by Knape & Vogt.
- .3 Pilasters: Clear anodized aluminum recessed shelf standards with 12 mm divisions, Model 233 by Knape & Vogt.
- .4 Clips: Bright zinc plated, adjustable height shelf supports, Model 256 by Knape & Vogt.
- .5 Cabinet hinges: Heavy duty, concealed, 100 degree, clip, self closing, Model MODUL by Blum.
- .6 Drawer and cabinet pulls: Stainless steel D pulls, manufactured by Canadian Builders Hardware.
- .7 Magnetic catches: Model 918 by Knape & Vogt.
- .8 Locks: Cam locks/deadbolt locks complete with lock core by Hafele, type to suit application and installation.

2.3 PLASTIC LAMINATE WORK

- .1 Perform plastic laminate work in accordance with AWS Quality Standards and ANSI/NEMA LD 3.

- .2 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .3 Laminate plastic laminates to core materials in accordance with manufacturer's instructions.
- .4 Fabricate core surfaces and profiles with continuous support and bond over entire surface to receive plastic laminate.
- .5 Apply plastic laminate backing sheets to balance shrinkage stresses induced by plastic laminate face sheets.
- .6 Minimize joints in plastic laminate Work; do not install joints in plastic laminate Work in less than 2400 mm o.c. Locate joints minimum 610 mm from cut-outs. Offset core and plastic laminate facing joints.
- .7 Form shaped profiles and bends as indicated, using postformed grade laminate to laminate manufacturer's instructions.
- .8 Edging to be done using 3 mm thick PVC to match plastic laminate colour to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .9 Apply laminated plastic liner sheet to interior of cabinetry and where indicated.

2.4 FABRICATION

- .1 Millwork core materials are to be as shown in the Architectural Drawings. Where 'plywood' core is indicated it is intended that other ply cores such as MDF, particlecore, particleboard, fibreboard etc. are not acceptable.
- .2 Be responsible for methods of construction and for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other sections.
- .3 Coordinate locations of concealed supports and blocking with other parts of Work. Provide cutouts for outlet boxes and other fixtures.
- .4 Fabricate work in a manner which will permit expansion and contraction of the materials without visible open joints. Conceal joints and connections in wherever possible.
- .5 Finished millwork shall be free from defects and shall be selected for uniformity of colour and texture.
- .6 Shelving to cabinetwork to be adjustable unless otherwise noted.
- .7 Recess shelf standards, unless noted otherwise. Stagger recessed shelf standards on opposite sides of divider.

- .8 Do not exceed maximum 760 mm unsupported span for 19 mm thick shelving. House fixed shelving into gables and divisions.
- .9 Shop assemble finish carpentry to accommodate delivery and handling and to ensure passage through building openings.
- .10 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .11 Fabricate units by solid surfacing manufacturer's certified or approved fabricator/installer. Fabricate built-up profiles as indicated.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 INSTALLATION

- .1 Install work in accordance with AWS Quality Standards and tolerances for Architectural Woodwork. Set and secure finish carpentry in place, rigid, plumb, square, and level.
- .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate columns, fixtures, outlets, or other projecting, intersecting or penetrating objects leaving a 0.8 mm gap maximum.
- .3 Coordinate cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures, in finish carpentry. Round internal corners of cut-outs and seal exposed cores.
- .4 Form joints to conceal shrinkage.
- .5 Install draw bolts and splines in laminated plastic counter top joints at maximum spacing 450 mm o.c., and 75 mm from edge. Make joints flush, hairline butt joints.
- .6 Install finishing hardware accurately and securely in accordance with manufacturer's directions, adjust and clean.
- .7 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.
- .8 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.

- .9 Melamine panels: Assemble melamine millwork using dowelled/wafered-and-glue construction. Installed melamine panels shall not show any exposed fasteners on finished/exposed surfaces.
- .10 Solid surfacing:
 - .1 Install solid surfacing in accordance with manufacturer's instructions.
 - .2 Align work plumb and level.
 - .3 Seal perimeter of fabrication to adjacent construction in accordance with Section 07 92 00.
- .11 Upholster:
 - .1 Upholster new built-in furniture in sizes and details as noted.
 - .2 Anchor wood to supports in a concealed manner.
 - .3 Mitre joints at corners. Keep joints to a minimum.
 - .4 Round all corners, edges and ends.
 - .5 Upholstery fabric material shall be applied in exact order they are cut from roll to obtain a pattern matched and seamless appearance in adjoining fabric material.
 - .6 Fabric at corners and edges shall be applied smooth to form true sharp tailored corners and edges without fraying.
 - .7 Trim additional selvage where required to achieve colour and pattern match at seams.
 - .8 Secure seat components with continuous rows of fold-down strips. Accurately place strips so that intimate contact is made with nesting seats so no portion of tape is left exposed.
 - .9 Upholstered panels and sections shall remain securely in place and with smooth appearance, having with no signs of sagging, wrinkles or distortions.
- .12 Fastening:
 - .1 Coordinate wall securement, anchorage, and blocking for finish carpentry items.
 - .2 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - .3 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
 - .4 Provide heavy duty fixture attachments for wall mounted cabinets.
 - .5 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round cleanly cut hole and plug with wood plug to match material being secured.
- .13 Remove and replace damaged, marked, or stained finish carpentry.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for sealant Work in accordance with the Contract Documents.
- .2 Work of this Section does not include sealants in firestopping and smoke sealed assemblies.
- .3 Work of this Section does not include sealant work identified in individual specification sections.

1.2 **REFERENCES**

- .1 ASTM C834, Specification for Latex Sealants.
- .2 ASTM C920, Specification for Elastomeric Joint Sealants.
- .3 ASTM C1330, Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

1.3 **SUBMITTALS**

- .1 Product data: Submit copies of Product data in accordance with Section 01 00 00 describing type, composition and recommendations or directions for surface preparation, material preparation and material installation.
- .2 Samples:
 - .1 Submit following samples in accordance with Section 01 00 00.
 - .1 Two samples of sealant/caulking, for colour selection.
 - .2 Two samples of back-up material and primer for physical characteristics.

1.4 **QUALITY ASSURANCE**

- .1 Qualifications: Work of this Section shall be executed by trained applicators approved by sealant manufacturer and having a minimum of 5 years proven experience.
- .2 Mock-up:
 - .1 Construct one 1200 mm long mock-up of each sealant type in location acceptable to Consultant.
 - .2 Demonstrate joint preparation, sealant application and tooling.
 - .3 Arrange for Consultant's review and acceptance.
 - .4 Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.

.5 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.

.3 Pre-installation meetings: Arrange with manufacturer's representative and Consultant to inspect substrates, and to review installation procedures 48 hours in advance of installation.

1.5 SITE CONDITIONS

.1 Do not install materials when ambient air temperature is less than 5°C, when recesses are wet or damp, or to manufacturer's recommendations.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Arrange delivery of materials in original, unopened packages with labels intact, including batch number, and ensure that on-site storage is kept to a minimum. Do not store materials on site where there exists any danger of damage from moisture, direct sunlight, freezing and other contaminants.

1.7 EXTENDED WARRANTY

.1 Submit a extended warranty for Sealant Work in accordance with General Conditions, except that warranty period is extended to 2 years from date of Substantial Performance of the Work.

.1 Warrant against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion and staining adjacent surfaces.

.2 Coverage: Complete replacement including affected adjacent Work.

2 Products

2.1 MATERIALS

.1 General:

.1 All materials under Work of this Section, including but not limited to, primers and sealants are to have low VOC content limits.

.2 Use materials as received from manufacturers, without additives or adulterations. Use one manufacturer's Product for each kind of Product specified.

.2 Sealant **Type A**: ASTM C920, Type S, Grade NS, Class 25; One-part, non-sag type, silicone sealant, in standard colours selected.

.1 'DC CWS' by Dow Corning Inc.

.2 'Sikasil 305CN' by Sika.

.3 'Tremsil 400' by Tremco.

- .3 Sealant **Type B**: ASTM C920, Type S, Grade NS; One-part mildew-resistant silicone, in standard colours selected.
 - .1 '786 Mildew Resistant Silicone Sealant' by Dow Corning Inc.
 - .2 'Sikasil GP Mildew Resistant' by Sika.
 - .3 'Tremsil 200 Silicone Sealant' by Tremco Ltd.

2.2 ACCESSORIES

- .1 Primers: Type recommended by material manufacturers for various substrates, primers to prevent staining of adjacent surfaces encountered on project.
- .2 Joint backing: ASTM C1330; Round, solid section, closed cell, skinned surface, soft polyethylene foam gasket stock, compatible with primer and sealant materials, 30 to 50% oversized, Shore A hardness of 20, tensile strength 140 to 200 kPa. Bond breaker type surface.
- .3 Bond breaker: Type recommended by material manufacturers.
- .4 Void filler around the window frames to be one part expanding polyurethane foam.
- .5 Cleaning agents: As recommended by material manufacturer, non-staining, harmless to substrates and adjacent finished surfaces.

2.3 MIXING

- .1 Follow manufacturers instructions on mixing, shelf and pot life.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 PREPARATION

- .1 Prepare joints to receive sealants to manufacturer's instructions. Ensure that joints are clean and dry and ferrous surfaces are free from rust and oil.
- .2 Clean recesses to receive sealant, to be free of dirt, dust, loose material, oil, grease, form release agents and other substances detrimental to sealant's performance.

- .1 Remove lacquer or other protective coatings from metal surfaces, without damaging metal finish, using oil-free solvents. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sand blasting.
 - .2 Ensure recess is dry.
 - .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings. Remove incompatible coatings as required.
- .3 Ensure that all materials in contact with sealant are compatible. Test substrate for adhesion.
 - .4 Depth of recess: Maintain depth to $\frac{1}{2}$ joint width up to a maximum of 13 mm and not less than 6 mm at centre of joint. For greater depth, use joint backing under. Where recess is less than specified depth, cut back surface of recess to specified recess depth.
 - .5 Install polyethylene backing rod in joints 6 mm or more in width. Roll backing rod into joint. Do not stretch or bend backing rod. Install bond breaker to back of recess.
 - .6 Prime sides of recess, in accordance with sealant manufacturer's instructions.
 - .7 Condition products for use in accordance with manufacturer's recommendations.

3.3

INSTALLATION

- .1 Apply sealant immediately after adjoining Work is in condition to receive such Work. Apply sealant in continuous bead using gun with correctly sized nozzle. Use sufficient pressure to evenly fill joint.
- .2 Ensure sealant has full uniform contact with, and adhesion to, side surfaces of recess. Superficial painting with skin bead is not acceptable. Tool sealant to smooth surface, free from ridges, wrinkles, sags, air pockets, embedded impurities, dirt, stains or other defects.
 - .1 At recesses in angular surfaces, finish sealant with flat profile, flush with face of material at each side.
 - .2 At recesses in flush surfaces, finish compound with concave face, flush with face of material at each side.
- .3 Make sealant bead uniform in colour.
- .4 Cure sealants in accordance with sealant manufacturer's instructions. Do not cover up sealants until proper curing has taken place.
- .5 Immediately remove excess compound or droppings which would set up or become difficult to remove from adjacent finished surfaces, using recommended cleaners, as work progresses. Do not use scrapers, chemicals or other tools which could damage finished surfaces. Remove defective sealant.

- .6 Clean recesses and re-apply sealant.
- .7 Remove masking tape immediately after joints have been sealed and tooled.

3.4 **CLEANING**

- .1 Clean surfaces adjacent to joints, remove sealant smears or other soiling resulting from application of sealants. At metal surfaces, remove residue. Do not mar or damage finishes on materials adjacent to joints. Repair or replace marred or damaged materials.

3.5 **SCHEDULE OF LOCATIONS**

- .1 Following sealant location schedule is included for convenience and may not be complete. Examine Contract Drawings and other specification sections and determine entire extent of Work of this Section. Generally seal following locations:
 - .1 Concrete, masonry, wood and stone to metal.
 - .2 Wood to masonry, concrete and stone.
 - .3 Metal to metal.
 - .4 All dissimilar materials.
 - .5 Where 'sealant' or 'caulking' in indicated on drawings.
- .2 Sealant **Type A:**
 - .1 Control joints, except in floors .
 - .2 Door frames, interior and exterior side.
 - .3 Protrusions through walls and floors, except where fire rated seals are required.
 - .4 Seal thresholds.
- .3 Sealant **Type B:**
 - .1 Control joints in wall panel areas.
 - .2 Between vanity and finished face of wall.
 - .3 Between vanity and mechanical fixtures/fittings.
 - .4 Between access panels and finished face of wall and/or ceiling.
 - .5 Between tiles and adjacent materials.

END OF SECTION

1 General

1.01 Related Documents

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 Summary

- A. This Section includes the following:
 - 1. Architectural joint systems for building interiors.
- B. Related Sections include the following:
 - 1. Division 03 Section "Cast-in-Place Concrete" for cast-in architectural-joint-system frames furnished, but not installed, in this Section.
 - 2. Division 04 Section "Unit Masonry" for masonry wall joint systems.
 - 3. Division 07 Section "Sheet Metal Roofing" for sheet metal roof joint systems.
 - 4. Division 07 Section "Sheet Metal Flashing and Trim" for sheet metal wall joint systems.
 - 5. Division 07 Section "Fire-Resistive Joint Systems" for liquid-applied joint sealants in fire-resistive building joints.
 - 6. Division 07 Section "Joint Sealants" for liquid-applied joint sealants.

1.03 Definitions

- A. Maximum Joint Width: Widest linear gap a joint system tolerates and in which it performs its designed function without damaging its functional capabilities.
- B. Minimum Joint Width: Narrowest linear gap a joint system tolerates and in which it performs its designed function without damaging its functional capabilities.
- C. Movement Capability: Value obtained from the difference between widest and narrowest widths of a joint.
- D. Nominal Joint Width: The width of the linear opening specified in practice and in which the joint system is installed.

1.04 Submittals

- A. Shop Drawings: Provide the following for each joint system specified and obtain approval prior to fabrication and shipment of materials to the job site:
 - 1. Placement Drawings: Include line diagrams showing plans, elevations, sections, details, splices, blockout requirement, entire route of each joint system, and attachments to other work. Where joint systems change planes, provide isometric or clearly detailed drawing depicting how components interconnect.
- B. Product Data: Submit copies of manufacturer's latest published literature for materials specified herein for approval, and obtain approval before materials are fabricated and delivered to the site. Data to clearly indicate movement capability of cover assemblies and suitability of material used in exterior seal for UV exposure.
- C. Samples for Initial Selection: For each type of joint system indicated.
 - 1. Include manufacturer's color charts showing the standard range of colors and finishes available for each exposed metal and elastomeric seal material.
- D. Certificates – Material test reports from qualified independent testing laboratory indicating and interpreting test results relative to compliance of fire-rated expansion joint assemblies with requirements indicated.

1.05 Quality Assurance

- A. Installer Qualifications: Approved by manufacturer and having experience installing joint systems that are similar in design complexity.

- B. Source Limitations: Obtain all architectural joint systems through one source from a single manufacturer.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of architectural joint systems and are based on the specific systems indicated. Refer to Division 01 Section "Product Requirements."
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- D. Loading Characteristics: Standard loading refers to covers that are capable of withstanding up to 500 lb. point loads. Heavy duty refers to covers that are capable of withstanding up to 2000 lb. point loads.
- E. Fire-Test-Response Characteristics: Where indicated, provide architectural joint system and fire-barrier assemblies identical to those of assemblies tested for fire resistance per UL 2079 and/or ASTM E 1966 by a testing and inspecting agency acceptable to authorities having jurisdiction. Fire rating not less than the rating of adjacent construction.
- F. Manufacturer to provide 5 year warranty for all joint covers.

1.06 Coordination

- A. Coordinate installation of exterior wall joint systems with roof expansion assemblies to ensure that wall transitions are watertight and maintain a consistent aesthetic appearance with ceiling and floor assemblies.

PART 2 - Products

2.01 Manufacturers

- A. Basis of Design – manufactured by Construction Specialties subject to compliance with requirements listed. The Expansion Joint Covers and related materials herein specified and indicated on the drawings shall be manufactured by: Construction Specialties, 3 Werner Way, Lebanon, NJ 08833. Tel. 800.233.8493. Email: cet@c-sgroup.com. No substitutions.
- B. Drawings and specifications are based on manufacturer's literature from Construction Specialties, Inc. drawings and specifications unless otherwise indicated. Other manufacturers must be approved equal by Architect/Owner.

2.02 Materials

- A. Aluminum: ASTM B 221, Alloy 6063-T5, 6063-T6, 6063-T52, 6061-T5, 6061-T6, 6061-T51, 6105-T5, 6105-T6, 6005-T5, 6005A-T5, 6005A-T61 for extrusions; ASTM B 209, Alloy 6061-T6, 3003-H14, 5005-H34 for sheet and plate.
 - 1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.
 - 2. Mill Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).
 - 3. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.
 - 4. Class II, Color Anodic Finish: AA-M12C22A32/A34 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, integrally colored or electrolytically deposited color coating 0.010 mm or thicker) complying with AAMA 611.
 - 5. High-Performance Organic Finish (Two-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70

percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2604 and with coating and resin manufacturers' written instructions.

- B. Stainless Steel: ASTM A167, A240A, A240M - Type 304 for plates, sheet, and strips.
 - 1. Finish: No.4, directional satin.
 - a. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
 - b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- C. Brass: ASTM B 36/B 36M, UNS Alloy C26000 for half hard sheet and coil.
- D. Bronze: ASTM B 455, Alloy C38500 for extrusions; Alloy C28000 Muntz Metal for plates.
- E. Elastomeric Seals: Preformed elastomeric membranes or extrusions to be installed in metal frames.
- F. Compression Seals: ASTM D2000; preformed rectangular elastomeric extrusions having internal baffle system and designed to function under compression.
- G. Fire Barriers: Any material or material combination, when fire tested to UL2079 standards after cycling, designated to resist the passage of flame and hot gases through a movement joint and to meet performance criteria for required rating period.
 - 1. Joint Size 1" -4"- use Reflex® Fire barrier
 - 2. Joint Size 5" -30"- use FB-17 Fire barrier
 - 3. Joint Size 30"+ - use FB-97 Fire Barrier
- H. Vapor Barrier: 7-ply laminate reinforced Polyethylene ASTM E-1745-97, Color – Black, 3" tensile Strength – 275 lbs., ASTM-D882, Puncture Strength -79 lbs., ASTM-4833-PPT Resistance-6 lbs., ASTM D-2582.
- I. Accessories: Manufacturer's standard anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

2.03 Architectural Joint Systems, General

- A. General: Provide architectural joint systems of design, basic profile, materials, and operation indicated. While specified joint systems establish the function and aesthetic intent, it may be necessary for the manufacturer to modify the joint systems to accommodate the movement requirements as scheduled in the contract documents. Such modifications should be made without significant changes to the aesthetic or functional intent of the joint systems. Provide units with capability to accommodate variations in adjacent surfaces.
- B. Design architectural joint systems for the following size and movement characteristics:
 - 1. Nominal Joint Width: *V.I.F.*
 - 2. Maximum Joint Width: *V.I.F.*
 - 3. Minimum Joint Width: *V.I.F.*
 - 4. Lateral Shear Movement Capability: *Zero.*

2.04 Architectural Joint Systems for Building Interiors

- A. Construction Specialties, Inc., shall manufacture expansion joint cover assemblies specified herein and indicated on the drawings. Other manufacturers may be accepted as substitutions only if the manufacturer can demonstrate product compliance with the requirements of the contract documents. Substitution requests must be reviewed prior to bid and must include the following information:
 - 1. Details
 - 2. ASTM- E1399 test reports
 - 3. Mock-ups
 - 4. Reference list of projects with similar products as those specified herein.
 - 5. Sample of written 5 year warranty

- B. Wall-to-Wall Joint Systems:
 - 1. Basis-of-Design Product: Construction Specialties, Inc. model *ASM 200*
 - 2. Type: Snap-on cover.
 - a. Exposed Metal: Aluminum.
 - 1) Finish: Class II, clear anodic or Kynar® color options.
 - 3. Duroflex Gasket
 - a. Single Durometer – 80 Shore A, ASTM D2000
 - 1) Color: Gray
 - 4. Fire-Resistance Rating: Provide joint system and fire-barrier assembly with a rating not less than that of adjacent construction.
 - 5. Vapor Barrier: Manufacturer's standard.
 - 6. Tamper resistant: no exposed fasteners for tamper proof applications.
- C. Wall Corner Joint Systems:
 - 1. Basis-of-Design Product: Construction Specialties, Inc. model *ASMC*
 - 2. Type: Snap-on cover.
 - a. Exposed Metal: Aluminum.
 - 1) Finish: Class II, clear anodic or Kynar® color options.
 - 3. Duroflex Gasket
 - b. Single Durometer – 80 Shore A, ASTM D2000
 - 2) Color: Gray
 - 4. Fire-Resistance Rating: Provide joint system and fire-barrier assembly with a rating not less than that of adjacent construction.
 - 5. Vapor Barrier: Manufacturer's standard.
 - 6. Tamper resistant: no exposed fasteners for tamer proof applications.

2.05 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable.

PART 3 - Execution

3.01 Examination

- A. Examine surfaces and blockouts where architectural joint systems will be installed for installation tolerances and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 Preparation

- A. Prepare substrates according to architectural joint system manufacturer's written instructions.
- B. Coordinate and furnish anchorages, setting drawings, and instructions for installing joint systems. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of joint systems.

3.03 Installation

- A. Comply with manufacturer's written instructions for storing, handling, and installing architectural joint assemblies and materials unless more stringent requirements are indicated.
- B. Metal Frames: Perform cutting, drilling, and fitting required to install joint systems.

1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
 2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation. Notify Architect where discrepancies occur that will affect proper joint installation and performance.
 3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
 4. Locate in continuous contact with adjacent surfaces.
 5. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.
- C. Seals in Metal Frames:** Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
1. Provide in continuous lengths for straight sections.
 2. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.
- D. Compression Seals:** Apply adhesive or lubricant adhesive as recommended by manufacturer before installing compression seals.
- E. Fire-Resistance-Rated Assemblies:** Coordinate installation of architectural joint assembly materials and associated work so complete assemblies comply with assembly performance requirements.
1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.
- F. Vapor Barrier:** Provide vapor barrier at exterior joints and where called for on Drawings. Provide drainage fittings where indicated.

3.04 Protection

- A.** Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.
- B.** Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over joints. Reinstall cover plates or seals prior to Substantial Completion of the Work.

END OF SECTION

1 General

1.1 SECTION INCLUDES

.1 Design, labour, Products, equipment and services necessary for gypsum board Work.

1.2 REFERENCES

.1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.

.2 ASTM C475, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.3 ASTM C645, Specification for Nonstructural Steel Framing Members.

.4 ASTM C665, Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

.5 ASTM C754, Specification for Steel Framing Members to Receive Screw-Attached Gypsum Board.

.6 ASTM C834, Standard Specification for Latex Sealants.

.7 ASTM C840, Specification for Application and Finishing of Gypsum Board.

.8 ASTM C1002, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.9 ASTM C1177, Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

.10 ASTM C1396, Specification for Gypsum Board.

.11 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 DESIGN REQUIREMENTS

.1 Design ceiling suspension system in accordance with manufacturer's printed directions and ASTM C754.

.2 Design ceiling system for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.

.3 Design hanger anchor and entire suspension system static loading not to exceed 25% of their ultimate capacity including lighting fixture dead loads.

- .4 Design suspension system to support weight of mechanical and electrical items such as air handling boots and lighting fixtures, and with adequate support to allow rotation/relocation of light fixtures.
- .5 Design subframing as necessary to accommodate, and to circumvent, conflicts and interferences where ducts or other equipment prevent the regular spacing of hangers.
- .6 Design steel stud framing system for wall assemblies with a height greater than 3000 mm and those assemblies incorporating non-standard gypsum board assemblies including, but not limited to, abuse resistant gypsum board, cement board, and at large format tile applications.

1.4 REGULATORY REQUIREMENTS

- 1. Provide fire separations and fire protection exactly as specified in test design specification that validates the specified rating. Verify that work specified in other Sections, as a part of the entire assembly, meets applicable validating test design specification.

1.5 SUBMITTALS

- .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop Drawings: Submit Shop Drawings in accordance with Section 01 00 00 indicating wall assemblies, suspension systems, adjacent construction, elevations, sections and details, dimensions, thickness, finishes and relationship to adjacent construction.
 - .3 Certifications: Submit written certification stating that suspended ceiling system is designed for adequate support of electrical fixtures as required by the current bulletin of the Electrical Safety Authority.

1.6 QUALITY ASSURANCE

- .1 Qualifications: Execute the Work of this Section by skilled, qualified, and experienced workers trained in the installation of the Work of this Section.
- .2 Retain a Professional Engineer, licensed in Province of Ontario, with experience in Work of comparable complexity and scope, to perform following services as part of Work of this Section:

- .1 Design of wall systems with height greater than 3000 mm and at non-standard gypsum board assemblies including, but not limited to, assemblies incorporating abuse resistant gypsum board, cement board, and large format tile applications.
- .2 Design of suspended gypsum board assemblies.
- .3 Review, stamp, and sign Shop Drawings and design calculations.
- .4 Conduct shop and on-site inspections, prepare and submit written inspection reports verifying that this part of Work is in accordance with Contract Documents and reviewed Shop Drawings.

1.7 SITE CONDITIONS

- .1 Do not begin Work of this Section until:
 - .1 Mechanical and electrical Work above the ceiling is complete.
 - .2 Substrate and ambient temperature is above 15°C.
 - .3 Relative humidity is below 80 %.
 - .4 Ventilation is adequate to remove excess moisture.
- .2 Install temporary protection and facilities to maintain Product manufacturer's, and above specification, environmental requirements 24 h before, during, and 24 h after installation.

2 Products

2.1 MATERIALS

- .1 General: All materials under Work of this Section, including but not limited to, sealants, adhesives, and primers are to have low VOC content limits.
- .2 Steel framing: ASTM C754; ASTM A653/A653-M, Z275; cold rolled, galvanized steel sheet.
 - .1 Bailey Metal Products Limited
 - .2 Corus Metal Profiles
- .3 Steel studs and track runners: ASTM C645; Galvanized steel studs and runners, 32 mm wide x depth as indicated on Contract Drawings. Formed from galvanized steel sheet, thicknesses as follows:
 - .1 Less than 3000 mm: Minimum 0.53 mm (25 ga.).
 - .2 Greater than 3000 mm and non-standard assemblies: Minimum 0.91 mm (20 ga.), unless otherwise required to accommodate intended condition.
- .4 Sheet steel blocking: Galvanized sheet steel: ASTM A653/A653M Grade A, Z275 Commercial Quality zinc coating. 0.91 mm thick (20 ga.) thick for use as sheet blocking.
- .5 Main carrying channels: ASTM C645; Formed from galvanized steel sheet, 38 x 19 mm cold rolled, channels.

- .6 Resilient channel: ASTM C645; 0.5 mm thick galvanized metal, 57 mm wide x 12 mm deep for walls and ceiling to reduce sound transmission.
- .7 Furring channels: ASTM C645; Formed from galvanized steel sheet, 22 mm winged flange type, cold rolled.
- .8 Furring channels (hat type): ASTM C645; 0.5 mm base steel thickness, galvanized. 70 mm wide x 22 mm deep hat shaped channel.
- .9 Heavy duty furring channels: ASTM C645; 0.9 mm steel thickness, galvanized hat shaped channel with a wider and deeper size as required by manufacturers.
- .10 Hanger wires: 4.1 mm minimum diameter galvanized pencil rod.
- .11 Tie wire: 1.6 mm thick minimum diameter, soft annealed, galvanized steel wire.
- .12 Corner bead, casing bead, and special shapes: Formed from 0.6 mm thick minimum, galvanized steel sheet, designed to be concealed by joint compound.
- .13 Deflection track: ASTM C 645 top runner with 50.8-mm- deep flanges, in thickness indicated for studs and in width to accommodate depth of studs.
- .14 Ceiling clips: Hot dip galvanized partition attachment clips, in square and reveal edge; 'PAC 15 Series' to match grid system by CGC Inc. or approved alternative.
- .15 Control joint strip: Roll formed from galvanized steel sheet, with a tape protected recess, 6 mm wide x 11 mm deep.
- .16 Screw fasteners: ASTM C1002 Type S; Corrosion resistant.
- .17 Concrete anchors: tie wire sleeve anchors, 'Redi-Drive Anchors' by ITW Red Head or approved alternative.
- .18 Acoustic/Fire insulation: ASTM C665, Paperless, semi-rigid, spun mineral fibre mats, of thickness as indicated on Contract Drawings, 'Sustainable Insulation, NoiseReducer' by CertainTeed, 'EcoTouch Quiet Zone Pink Fiberglas Acoustic Insulation' by Owens Corning Inc. or 'Roxul AFB' by Roxul Inc.
- .19 Acoustical sealant:
 - .1 Non-rated assemblies: ASTM C834; Acrylic, mould resistant sealant, paintable. 'Smoke and Acoustic Sealant CP506' by Hilti or approved alternative.
 - .2 Fire-rated assemblies: ASTM E84; Acrylic based firestop sealant, colour: red or white as selected by Consultant. 'Flexible Firestop Sealant CP606' by Hilti or approved alternative.
- .20 Gypsum board: ASTM C1396; thickness as indicated of maximum practical lengths to minimize end joints. Furnish Board by CertainTeed Gypsum Canada, CGC Inc., or Georgia-Pacific Canada LP.

- .21 Fire rated gypsum board: ASTM C1396; minimum 15.9 mm thick of maximum practical lengths to minimize end joints, unless indicated otherwise. Furnish Type X Board by Certainteed Gypsum Canada, CGC Inc., or Georgia-Pacific Canada LP.
- .22 Abuse Resistant Panels: ASTM C1396; thickness as indicated; 'Abuse Resistant' by Certainteed Gypsum Canada, 'Sheetrock AR' by CGC Inc. or 'ToughRock' by Georgia-Pacific Canada LP.
- .23. Cementitious Board: ASTM C1177, thickness as indicated, high strength portland cement building panel with self adhesive glass tape; provide board with heavier mesh reinforcement for suspended applications. 'Durock Cement Board Next Gen.' by CGC Inc., or approved alternative by Certainteed Gypsum
- .24 Moisture and mould resistant board: thickness as indicated of maximum practical lengths to minimize end joints, unless indicated otherwise; 'M2Tech Moisture and Mould Resistant' by Certainteed Gypsum Canada, 'Sheetrock Mold Tough' by CGC Inc. or 'DensArmor Plus High Performance Interior Panel' by Georgia-Pacific Canada LP.
- .25 Shaftwall gypsum system:
 1. Steel J-Runner: ASTM C645; Rolled formed sheet steel, 25 gauge, by CGC, Gypsum Corporation or approved alternative.
 2. C-H stud: hot-dipped galvanized by CGC, Gypsum Corporation or approved alternative.
 3. Liner Panel: ASTM C1396; Gypsum wallboard panel, Thickness: 25.4 mm, Width: 610 mm. 'M2Tech Shaftliner Type X' by Certainteed Gypsum Canada, or approved alternative by CGC or Gypsum Corporation.
 4. Face Panel: ASTM C1396; Gypsum wallboard panel, 1 layer, Thickness: 15.9 mm, Width: 1219 mm. 'GlasRoc Shaftliner Type X' by Certainteed Gypsum Canada, or approved alternative by CGC or Gypsum Corporation
- .26. Latex Fortified Mortar: Of type recommended by cementitious board manufacturer to suit application.
- .27 Joint reinforcing tape:
 1. Standard gypsum board: ASTM C475; 50 mm wide x 0.25 mm thick, perforated paper, with chamfered edges.
 - .2 Moisture resistant and tile backer boards: ASTM C475; fibreglass mat joint tape as recommended by board manufacturer to suit location.
 3. Cement Board: Mesh reinforcing tape recommended by cement board manufacturer.
- .28 Joint and patching compound: ASTM C475; Asbestos-free, supplied by manufacturer of gypsum board used.
- .29 Fast setting patching compound: ASTM C475; Asbestos-free, Sheetrock or Durabond by CGC Inc., 'Moisture and Mold Resistant Setting Compound with M2Tech' by Certainteed Gypsum Canada or approved alternative.

- .30 Access doors: Supplied by other Sections for installation as part of the Work of this Section.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 SUSPENSION FRAMING

- .1 Install ceiling systems in accordance with reviewed Shop Drawings and manufacturer's written instructions.
- .2 Install hanger wires plumb and securely anchored to the building structural framing, independent of walls, pipes, ducts, and metal deck; install additional framing and hangers to bridge interference items.
- .3 Install hanger wires at 1200 mm maximum centres along carrying channels, not less than 25 mm, and not more than 150 mm from channel ends.
- .4 Install additional hangers at lighting fixture and ductwork locations. Do not attach hanger wires to mechanical or electrical equipment. Do not support mechanical and electrical fixtures and fitting on ceiling without the ceiling manufacturer's written acceptance.
- .5 Install main carrying channels transverse to structural framing members. Lap main carrying channels 200 mm minimum at splices and wire each end with two loops and prevent clustering or lining-up of splices.
- .6 Install furring channels at 400 mm o.c., not less than 25 mm, and not more than 150 mm from perimeter walls, at openings, at interruptions in ceiling continuity, and at change in plane. Install furring channels to a tolerance of 3 mm maximum in 3600 mm.
- .7 Install additional main carrying and furring channels to frame and to reinforce openings such as recessed lighting fixtures, access hatches, ceiling grilles, outlet boxes, ventilating outlets and similar items.

3.3 STEEL STUDS AND FURRING

- .1 Install steel studs and furring in accordance with reviewed Shop Drawings and manufacturer's written instructions.
- .2 Provide 20 ga. thick galvanized sheet blocking for locations as indicated on Contract Drawings.

- .3 Install steel stud partitions to underside of structure unless indicated otherwise.
- .4 Install track runners at floors, ceilings, and underside of structure; align track runners accurately and secure to structure at 600 mm centres maximum.
- .5 Install double top track runner assembly to prevent the transmission of structural loads to steel studs.
- .6 Install steel studs vertically at 400 mm o.c., unless otherwise indicated, and not more than 50 mm from abutting walls, at openings, and at each side of corners. Install studs securely to track runners.
- .7 Schedule and coordinate steel framing installation with mechanical and electrical services installation.
- .8 Install full height, double studs at door and service openings, fastened together and stiffened back to the structure to prevent vibration when doors close.
- .9 Provide double studs boxed together at all openings, sill, head and jambs and at door jambs, fastened together and stiffened back to the structure to prevent vibration. At each opening exceeding 900 mm in width, double studs shall be 20 ga. extending to structure above, and adequately anchored at each end. Provide steel studs above and below openings spaced at 400 mm oc maximum. All metal stud partitions above doors and screens over 1220 mm wide shall be secured to structure over and reinforced with sway bracing to stabilize walls to prevent lateral movement.
- .10 Erect three studs at corner and intermediate intersections of partitions. Space 50 mm apart and brace together with wired 19 mm channels.
- .11 Stiffen partitions over 2440 mm high or 3000 mm long, or both, with horizontal bracing extended for full length of partitions. Provide one line of bracing in partitions. Space lines to provide equal unbraced panels. Provide bracing for portions of partitions over door openings in partitions over 3000 mm high, and bracing both above and below openings in partitions located no greater than 150 mm from top and bottom of opening, and extending two stud spaces beyond each edge of opening for both doors and windows. Wire tie or weld bracing to studs.
- .12 Frame control joints using back to back double studs at abutting structural elements, at dissimilar backup interface, at dissimilar walls and ceilings, at structural expansion and control joints, at door and other openings, and at 9000 mm maximum spacing in continuous runs. Install control joint strips and secure in place.
- .13 Install additional support framing at openings and cutouts for built-in equipment, upper cabinet support, access panels and similar items.

- .14 Attach to framing adequate steel reinforcing members or an 18 ga. steel stud mounted horizontally and notched around furring members to support the load of, and to withstand the withdrawal and shear forces imposed by, items installed upon the work of this Section. Such items include, but are not restricted to, coat hooks, washroom accessories, handrail anchors, rub rails, grab bars, guards, wall-hung cabinets and fitments, shelving, curtain and drape tracks; Owner supplied equipment; and minor mechanical and electrical work. Heavy mechanical and electrical equipment shall be self-supporting in Divisions 21, 22, 23 and 26.
- .15 Provide for support and incorporation of flush-mounted and recessed mechanical and electrical equipment and fixtures only after consultation and verification of methods with those performing the work of Divisions 21, 22, 23 and 26.
- .16 Install cross bracing in accordance with the steel stud manufacturer's recommendations.

3.4 FIRE RATED ASSEMBLIES

- .1 Install Products in fire rated assemblies in strict accordance with applicable ULC tested and approved designs.
- .2 Stiffen fire rated walls over 3.66 m high, where linear length of wall is greater than 2.44 m between perpendicular wall supports, with diagonal bracing above the ceiling extending perpendicular to wall at a 45° angle to structure above. Locate diagonal bracing at maximum 2.44 m o.c.
- .3 Where double layers of gypsum board are shown, and required for fire rating, screw first layer to studs and furring and laminate the second layer to the first using joint filler as an adhesive. Stagger joints between first and second layers.

3.5 ACOUSTICAL INSULATION

- .1 Install acoustic insulation in partitions, between steel studs, and as indicated on Contract Drawings and in accordance with the manufacturer's instructions. Fill stud cavities to full height of partitions and carefully cut and fit acoustic insulation around services and protrusions.

3.6 ACOUSTICAL SEALANT

- .1 Install acoustical sealant to acoustically insulated partitions in accordance with the manufacturer's instructions and Contract Drawings.
- .2 Install acoustical sealant under floor runner track, at partition perimeter both sides and at openings, cut-outs, and penetrations, concealed from view in the final installation.
- .3 Install firestop fill material behind fire rated acoustical sealant and provide firestop identification tag.

- .4 Smooth acoustical sealant with trowel prior to skin forming.

3.7 GYPSUM BOARD

- .1 Comply with ASTM C840. Install gypsum board in accordance with reviewed Shop Drawings and manufacturer's written instructions.
- .2 Install gypsum board vertically or horizontally, whichever results in fewer end joints. Locate end joints over supporting members.
- .3 Install gypsum board in lightly butted contact at edges and ends and with 1.6 mm maximum open space between boards; do not force gypsum board into place. Do not install imperfect, damaged or damp boards.
- .4 Install gypsum board butting paired tapered edge joints, and mill-cut or field-cut end joints; do not place tapered edges against cut edges or ends.
- .5 Install vertical joints minimum 300 mm from the jamb lines of openings and stagger vertical joints over different studs on opposite sides of partitions.
- .6 Do not locate joints within 200 mm of corners or openings, except where control joints occur at jamb lines or where openings occur adjacent to corners. Where necessary, place a single vertical joint over the centre of wide openings.
- .7 Cut, drill and patch gypsum board as may be necessary to accommodate the Work of other trades.
- 8. Fire Separations:
 - 1. Construct gypsum board assemblies, where located, in accordance with tested assemblies to obtain required or indicated fire rated assemblies. As a minimum fire separations shall consist of metal framing covered on both sides by fire-rated gypsum board.
 - 2. Install assemblies tightly to enclosing constructions to maintain integrity of the separations. Install casing beads at all perimeter edges.

3.8 CEMENT BOARD

- .1 Apply cementitious board to framing, with screw fasteners and taped joints in accordance with manufacturers instructions.
- .2 Pre-cut board to required sizes and make necessary cutouts. Fit ends and edges closely but not forced together.
- .3 Fasten board to steel framing with rust proof self-drilling, self-threading case hardened screws at 200 mm oc for walls and 150 mm oc for suspended applications.
- .4 Apply mesh tape centred over all joints and corners but not overlapped.

- .5 Apply 3 mm minimum thick skim coat of latex fortified mortar uniformly over entire cementitious board surfaces. Leave surface smooth and flat to receive subsequent finish.

3.9 SHAFTWALL LINER

- .1 Plan and lay out metal framing components to ensure that all wall sections are plumb and properly aligned.
- .2 Install J-track along the ceiling line and vertically at columns and abutting partitions, positioning the long legs closest to the shaft, using powder actuated fasteners or other approved method. Secure each piece with the appropriate fasteners spaced a maximum 610 mm O.C.
- .3 Attach J-track to the floor with fasteners spaced at 610 mm O.C.
- .4 Install Shaftliner panels vertically. The leading edge of the first panel must be attached to the long leg of the vertical J-track with 41 mm Type S screws spaced 610 mm O.C. Secure the top and bottom edges using the same fasteners and spacing.
- .5 Friction-fit C-H stud into the top and bottom tracks and slide it snugly against the Shaftliner panel. Make sure the edge of the board is in full contact with the centre web of the stud and covered by all the tabs.
- .6 Place the next Shaftliner panel between the tabs and flange on the opposite side of the C-H stud and secure it to the top and bottom track with 41 mm Type S screws spaced 610 mm O.C.
- .7 Install subsequent Shaftliner panels and C-H studs in the same manner. Check periodically to ensure they are plumb.
- .8 At the end of a partition run, cut the last Shaftliner panel slightly narrower and shorter than the opening to facilitate installation.
- .9 For walls exceeding 3.7 m in height, Shaftliner panel end joints shall fall alternately in the upper and lower 1/3 of the partition. Use a C-H stud placed horizontally between panels to secure each joint.
- .10 Frame all cut openings in the shaft side with J-track, providing adequate structural support for openings over 1219 mm.

3.10 CORNER, CASING BEADS AND TRIM

- .1 Corner reinforcing bead: Install along all external angles, erect plumb, level and with a minimum of joints. Secure with screws at 225 mm o.c. apply filler over flanges flush with nose of the bead and extending at least 75 mm onto surface of board each side of corner. When filler dries, apply a thin coat of topping cement and blend onto adjoining surfaces.

- .2 Casing bead: Install where wallboard butts against a surface having no trim concealing the juncture and where shown on drawings. Erect casing beads plumb or level, with minimum joints, and secure with screws at 300 mm o.c. apply filler over flange flush with bead and extending at least 75 mm onto surface of board. When dry, apply a thin coat of topping cement and blend onto adjoining surfaces.
- .3 Recess channels and trim: Install recess channels and special metal trim where shown. Secure to substrate. Provide casing beads full height on wallboard edges at recess channels and metal trim.

3.11 JOINT TAPING AND FINISHING

- .1 Install reinforcing tape and a minimum of 3 coats of joint compound over gypsum board joints, metal trim and accessories, and screw fasteners in accordance with the gypsum board manufacturer's instructions.
- .2 Fill gaps between ,and any imperfections in, gypsum boards with joint compound, allow to dry, and sand smooth ready for painting.
- .3 Install finished gypsum board Work smooth, seamless, plumb, true, flush, and with square, plumb, and neat corners.
- .4 Finish gypsum board in accordance with ASTM C840 to the following grades:
 1. Level 0: No taping, finishing, or accessories required. Use above suspended ceilings and within other concealed spaces, unless the assembly is fire rated, sound rated, sound or smoke controlled, or unless the space serves as an air plenum.
 2. Level 1: At joints and interior angles embed tape in joint compound. Leave surface free of excess joint compound. Tool marks and ridges are acceptable. Use above suspended ceilings and within other concealed spaces if the gypsum board assembly is fire rated, sound rated, sound or smoke controlled, or the space serves as an air plenum.
 3. Level 2: At joints and interior angles embed tape in joint compound with one separate coat of joint compound applied over joints, angles, fastener heads, and accessories. Use for water resistant gypsum board indicated for use as a substrate for ceramic tile.
 4. Level 3: At joints and interior angles embed tape in joint compound with two separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply joint compound smooth and free of tool marks and ridges. Use where heavy grade wall coverings are the final decoration.
 5. Level 4: At joints and interior angles embed tape in joint compound with three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply joint compound smooth and free of tool marks and ridges. Use for all locations except those indicated for other finish levels.

6. Level 5: At joints and interior angles embed tape in joint compound with three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. Apply a thin skim coat of joint compound, or a material manufactured especially for this purpose, to the entire surface. Leave surface smooth and free of tool marks and ridges. Use where semi-gloss or gloss finish coatings are the final decoration.

3.12 ACCESS DOORS

- .1 Install access doors, supplied as part of other parts of the Work, in accordance with manufacturer's written instructions.

3.13 SITE TOLERANCES

- .1 Install metal support systems to ensure that, within a tolerance of +3 mm and -1.5 mm for plaster thickness, finish surfaces will be flat within 3 mm under a 3 m straightedge, and with no variation greater than 1.5 mm in any running 300 mm, and that surface planes shall be within 3 mm of dimensioned location.

3.14 WORK IN EXISTING AREAS

- .1 In existing areas, where existing gypsum board work has been demolished and/or damaged and repair work is required, provide new gypsum board finish.
- .2 Thoroughly prepare areas to be repaired. Provide neat, clean and straight cuts.
- .3 Finish all repair work as specified for new work.
- .4 In existing areas where existing openings are to be filled in with gypsum board, provide new gypsum board wall and ceiling construction. Ensure new board faces are flush with faces of abutting existing walls and ceilings.

3.15 REPAIR

1. Make good cut-outs for services and other work, fill in defective joints, holes and other depressions with joint compound.
2. Make good defective work, and ensure that surfaces are smooth, evenly textured and within specified tolerances to receive finish treatments.

END OF SECTION

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- 1 General
 - 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for resilient base Work and accessories in accordance with the Contract Documents.
 - 1.2 **SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Samples: Submit two 250 mm long samples of resilient base in accordance with Section 01 00 00.
 - .3 Closeout submittals: Submit maintenance and cleaning data for incorporation into Operations and Maintenance Manuals in accordance with Section 01 00 00.
 - 1.3 **SITE CONDITIONS**
 - .1 Maintain air temperature and structural base temperature at installation area above 20°C for 48 hr before, during and 48 hr after installation.
 - .2 Store materials for 2 days prior to installation in area of Work to achieve temperature stability.
 - .3 Do not install base in conditions of high humidity or where exposed to cold drafts. In hot weather, protect from direct sunlight.
 - .4 Provide adequate ventilation during installation.
 - 1.4 **MAINTENANCE**
 - .1 Submit extra 5% or to nearest full roll of each colour, pattern and type of base required for maintenance use. Identify each carton. Store where directed.
 - 2 Products
 - 2.1 **MATERIALS**
 - .1 All materials under Work of this Section, including but not limited to, primers, and adhesives are to have low VOC content limits.

- .2 Resilient base: Size and type as indicated on drawings
 - .3 Primers and adhesives: Low VOC, waterproof, non-flammable, recommended by base manufacturer for specific material on applicable substrate, above, at or below grade.
- 3 Execution
- 3.1 **EXAMINATION**
- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
 - .2 Defective Work resulting from application to unsatisfactory surfaces will be considered the responsibility of those performing the Work of this Section.
- 3.2 **RESILIENT BASE APPLICATION**
- .1 Install resilient base in accordance with manufacturer's written instructions.
 - .2 Lay out base to keep number of joints at minimum.
 - .3 Prior to installing base, fill cracks and irregularities with a filler recommended by base manufacturer.
 - .4 Set base in adhesive using a 3 kg hand roller, against wall and floor surfaces.
 - .5 Install straight and level to variation of 1:1000.
 - .6 Scribe and fit to door frames and other obstructions.
 - .7 Cope internal corners.
- 3.3 **CLEANING**
- .1 Forty-eight hours after installation, clean resilient base surfaces with a mild soap solution approved by finish manufacturer.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for resilient sheet flooring
Work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient
Flooring.
- .2 ASTM F1516, Standard Practice for Sealing Seams of Resilient Floor Products by
the Heat Weld Method.
- .3 ASTM F1869, Standard Test Method for Measuring Moisture Vapor Emission Rate of
Concrete Subfloor Using Anhydrous Calcium Chloride.
- .4 ASTM F 2170, Standard Test Method for Determining Relative Humidity in Concrete
Slabs Using in-situ Probes.
- .5 CAN/ULC-S102.2-M, Method of Test for Surface Burning Characteristics of Flooring,
Floor Coverings, and Miscellaneous Materials and Assemblies.
- .6 ISO 717-2, Acoustics - Rating of Sound Insulation in Buildings and of Building
Elements - Part 2: Impact Sound Insulation.

1.3 **SUBMITTALS**

- .1 Product data:
- .1 Submit copies of manufacturer's Product data in accordance with Section 01
00 00 indicating:
- .1 Performance criteria, compliance with appropriate reference standard,
characteristics, and limitations.
- .2 Product transportation, storage, handling and installation
requirements.
- .2 Shop drawings: Submit shop drawings indicating seam layout and welding
procedures in accordance with Section 01 00 00.
- .3 Samples:
- .1 Submit samples in accordance with Section 01 00 00:
- .1 Submit two 250 x 200 mm samples of each type of sheet material and
colour.

.2 Submit two 100 mm x 100 mm samples of aluminum backed resilient base. Flash cove base samples must be representative of riser height and toe lengths specified, and shall represent one completed inside corner and one completed outside corner, with seams sealed and finished. Produce flash cove base samples in specified flooring materials and selected colours.

.4 Closeout submittals: Submit maintenance and cleaning data for incorporating into Operations and Maintenance Manuals in accordance with Section 01 00 00.

1.4 **QUALITY ASSURANCE**

.1 Installers qualifications (prefabricated flash cove bases): Perform work of this Section by a company that has a minimum of five years proven experience in the installation of prefabricated flash cove bases of a similar size and nature and that is approved by manufacturer. Submit to Consultant, installer's current certificate of approval by the material manufacturer as proof of compliance.

1.5 **SITE CONDITIONS**

.1 Maintain air temperature and structural base temperature at flooring installation area above 20°C for 48 hr before, during and 48 hr after installation.

.2 Store materials for 2 days prior to installation in area of Work to achieve temperature stability.

.3 Do not lay flooring in conditions of high humidity or where exposed to cold drafts. In hot weather, protect from direct sunlight.

.4 Provide adequate ventilation during installation.

1.6 **EXTENDED WARRANTY**

.1 Manufacturer's warranty:

.1 Sheet flooring: Provide flooring manufacturer's warranty naming Owner as beneficiary, covering excessive wear for a period of 5 years from the date Work is certified as Substantially Performed.

.2 Prefabricated flash cove base: Warrant prefabricated flash cove base for lifetime against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to punctures through aluminum backing at cove radius provided prefabricated flash cove base was installed professionally in accordance with manufacturer's written specifications.

1.7 MAINTENANCE

- .1 Submit extra 5% or to nearest full roll of each colour, pattern and type of flooring material and bases required for maintenance use. Identify each roll. Store where directed. Submit maintenance material in one piece and of same production run as installed materials.

2 Products**2.1 MATERIALS**

- .1 All materials under Work of this Section, including but not limited to, primers and adhesives are to have low VOC content limits.
- .2 Linoleum sheet flooring (**FL1** - resilient sheet flooring):
 - .1 Conforming to ASTM F2034, Type 1, 2.5 mm thick, homogeneous resilient flooring, made from natural ingredients, mixed and calendared onto a natural jute backing.
 - .2 Flame spread: 150 to CAN/ULC-S102.2-M.
 - .3 Smoke developed: 160 to CAN/ULC-S102.2-M.
 - .4 Impact sound reduction: when tested to ISO 717/2, 6 dB.
 - .5 Slip resistance: Static coefficient of slip resistance meets or exceeds 0.6 when tested in accordance with ASTM D2047.
 - .6 Static load limit: 450 pounds per square inch when tested in accordance with ASTM F970.
 - .7 Colours: Provide two colours to be selected by the Consultant from manufacturer's full colour range.
 - .8 Acceptable products and manufacturers: 'Marmoleum Concrete' by Forbo Flooring or approved alternative.
- .3 Prefabricated integral cove base:
 - .1 Fabricated from same material and dye lots as resilient sheet flooring types as specified, in maximum practical lengths, with 38 mm x 38 mm formed aluminum reinforcing bonded to back of base material. Height: 100 mm high, unless otherwise indicated.
 - .2 'FlashCove Prefabricated Bases' by FlashCove Prefabricated Bases Inc. or approved alternative.
- .4 Cove capping strips (**CC1**):
 - .1 Provide self-coving PVC capping strip for cove bases. 'Capping Strip C7' by Altro Flooring or approved alternative.
 - .2 Colours: As selected by the Consultant from manufacturer's full colour range.
- .5 Welding rod: type recommended by flooring manufacturer to complement flooring.
- .6 Primers and adhesives: Low VOC, waterproof, of types recommended by flooring and base manufacturer for specific material on applicable substrate, above, on or below grade.

- .7 Reducing edge strips, thresholds: Nitrile rubber plasticized vinyl, 80-95 Shore A Durometer, adhesive as recommended by manufacturer.
- .8 Concrete skim coat compound: High-performance, rapid-setting cement based skim coating compound. 'Ultra SkimCoat' by Mapei or approved alternative for filling minor voids and leveling existing substrate.
- .9 Stain sealer and polish: Type recommended by flooring manufacturer.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
- .2 Ensure concrete floors meet the following minimum requirements and requirements of the flooring manufacturer. If there is a conflict between these requirements and those of the flooring manufacturer, the more stringent shall apply.
 - .1 Internal Relative Humidity Test: Perform internal relative humidity testing in accordance with ASTM F2170. Results shall not exceed 80% RH.
 - .2 Moisture Test: Moisture emissions from concrete subfloors (cured for a minimum of 28 days) must not exceed 3 lbs per 1000sf per 24 hours (1.4 kg H₂O/24 hr/93 m²) for acrylic adhesive and 5lbs for polyurethane adhesive via the Calcium Chloride Test Method (ASTM F1869).
 - .3 The pH level of the subfloor surface shall not be higher than 9.9. If higher, subfloor must be neutralized.
- .3 Ensure that sub-floors have been provided as specified without holes, protrusions, cracks, depressions or other major defects.
- .4 Ensure that control joints have been filled and levelled.
- .5 Defective Work resulting from application to unsatisfactory surfaces will be considered the responsibility of those performing the Work of this Section.

3.2 **SUBFLOOR TREATMENT**

- .1 Install underlayment panels in accordance with manufacturer's written instructions.
- .2 Flooring shall be installed over subfloors conforming to ASTM F710 for concrete.
- .3 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .4 Apply sub-floor filler to low spots and cracks to achieve floor level to a tolerance of 1:1000, allow to cure.

- .5 Meet ASTM F710 Standard for Concrete or other monolithic floors.
- .6 Clean and remove all deleterious materials from surfaces to receive this Work in accordance with the adhesive manufacturer's recommendations.
- .7 Prime concrete to flooring manufacturer's printed instructions.

3.3 RESILIENT SHEET FLOORING APPLICATION

- .1 Install resilient sheet flooring in accordance with manufacturer's written instructions.
- .2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive that can be covered by flooring before initial set takes place.
- .3 Run sheets in direction of traffic. Double cut sheet joints and continuously seal according to manufacturer's printed instructions. Remove adhesive seepage of seams or surface while adhesive is still wet.
- .4 Heat weld seams in accordance with ASTM F1516 and manufacturer's printed instructions.
- .5 As installation progresses and after installation, roll flooring with minimum 45kg roller to ensure full adhesion.
- .6 Cut flooring neatly around fixed objects.
- .7 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .8 Install reducing edge strips at unprotected or exposed edges where flooring terminates or where there are two finishes of different thicknesses.

3.4 PREFABRICATED FLASH COVE BASE APPLICATION

- .1 Install prefabricated flash cove base in accordance with manufacturer's written instructions.
- .2 Provide integral coved base at room perimeter and at built-in fitment locations complete with accessories as required for complete and secure installation.
- .3 Dry-fit prefabricated flash cove base; cut and fit material to required lengths. Mitre-cut inside and outside corners.
- .4 Dry-fit and cut cove cap prior to prefabricated flash cove base installation.
- .5 Scribe glue line on walls and floor at edge of prefabricated flash cove base material.

- .6 Apply adhesive in full spread (100% coverage on 2 surfaces) for full length of prefabricated flash cove base material. Apply prefabricated flash cove base to wall surface straight and level.
- .7 Slide cap behind prefabricated flash cove base material.
- .8 Hand roll prefabricated flash cove base material onto wall and floor surface removing bumps, ripples and fishmouths. Remove excess adhesive.
- .9 Heat weld seams (vertical and horizontal) in prefabricated flash cove base material.

3.5 CLEANING AND SEALING

- .1 Forty-eight hours after installation, clean sheet flooring surfaces with a mild soap solution approved by finish manufacturer. Rinse clean and allow to dry.
- .2 If recommended by flooring manufacturer, provide sealer for resilient flooring. Apply stain sealer and allow to dry. Unless otherwise recommended by flooring manufacturer, apply three to five coats of sealer as recommended by flooring manufacturer and polish thoroughly.

3.6 PROTECTION OF FINISHED WORK

- .1 Protect floors and bases from time of final set of adhesive until accepted by Consultant.
- .2 Protect prefabricated flash cove bases from scratches, gouges, scuff marks and other damage from time initial surface protection application until final inspection.
- .3 Prohibit traffic on floor for 48 hours after installation.
- .4 Cover cleaned surfaces with fibre reinforced, clean, non-staining clean, kraft paper. Secure in position with gummed tape to prevent drifting. Remove covering when directed by Consultant.

END OF SECTION

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- 1 General
 - 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for resilient sheet flooring Work in accordance with the Contract Documents.
 - 1.2 **REFERENCES**
 - .1 ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - .2 ASTM F1516, Standard Practice for Sealing Seams of Resilient Floor Products by the Heat Weld Method.
 - .3 ASTM F1869, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
 - .4 ASTM F 2170, Standard Test Method for Determining Relative Humidity in Concrete Slabs Using in-situ Probes.
 - 1.3 **SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings: Submit shop drawings indicating seam layout and welding procedures in accordance with Section 01 00 00.
 - .3 Samples:
 - .1 Submit samples in accordance with Section 01 33 00:
 - .1 Submit two 250 x 200 mm samples of each type of sheet material and colour.
 - .4 Closeout submittals: Submit maintenance and cleaning data for incorporating into Operations and Maintenance Manuals in accordance with Section 01 00 00.
 - 1.4 **SITE CONDITIONS**
 - .1 Maintain air temperature and structural base temperature at flooring installation area above 15°C for 48 hr before, during and 48 hr after installation.
 - .2 Store materials for 2 days prior to installation in area of Work to achieve temperature stability.

- .3 Do not lay flooring in conditions of high humidity or where exposed to cold drafts. In hot weather, protect from direct sunlight.
- .4 Provide adequate ventilation during installation.

1.5 MAINTENANCE

- .1 Submit extra 5% or to nearest full roll of each colour, pattern and type of flooring and base material required for maintenance use. Identify each roll. Store where directed. Submit maintenance material in one piece and of same production run as installed materials.

1.6 EXTENDED WARRANTY

- .1 Manufacturer's warranty
 - .1 Safety flooring: Provide flooring manufacturer's warranty naming Owner as beneficiary, for a period of ten (10) years from the date Work is certified as Substantially Performed.

2 Products

2.1 MATERIALS

- .1 All materials under Work of this Section, including but not limited to, primers and adhesives are to have low VOC content limits.
- .2 Slip resistant flooring (**SF1**): Type, size, colour and finish indicted on finish schedule.
- .3 Welding rod: Type as recommended by flooring manufacturer.
- .4 Accessories: Types as recommended by flooring manufacturer.
- .5 Primers and adhesives: Low VOC, waterproof, of types recommended by flooring manufacturer for specific material on applicable substrate, above, on or below grade.
- .6 Concrete skim coat compound: High-performance, rapid-setting cement based skim coating compound. 'Ultra SkimCoat' by Mapei or approved alternative for filling minor voids and leveling existing substrate.
- .7 Prefabricated integral cove base:
 - .1 Fabricated from same material and dye lots as resilient sheet flooring types as specified, in maximum practical lengths, with 38 mm x 38 mm formed aluminum reinforcing bonded to back material. Height: 100 mm high, unless otherwise indicated.
 - .2 'FlashCove Prefabricated Bases' by FlashCove Prefabricated Bases Inc. or approved alternative.
- .8 Cove capping strips (**CC1**):
 - .1 Provide self-coving PVC capping strip for cove bases. 'Capping Strip C7' by Altro Flooring or approved alternative.
 - .2 Colours: As selected by the Consultant from manufacturer's full colour range.

3 Execution

3.1 EXAMINATION

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
- .2 Ensure concrete floors meet the following minimum requirements and requirements of the flooring manufacturer. If there is a conflict between these requirements and those of the flooring manufacturer, the more stringent shall apply.
 - .1 Internal Relative Humidity Test: Perform internal relative humidity testing in accordance with ASTM F2170. Results shall not exceed 80% RH.
 - .2 Moisture Test: Moisture emissions from concrete subfloors (cured for a minimum of 28 days) must not exceed 3 lbs per 1000sf per 24 hours (1.4 kg H₂O/24 hr/93 m²) for acrylic adhesive and 5lbs for polyurethane adhesive via the Calcium Chloride Test Method (ASTM F1869).
 - .3 The pH level of the subfloor surface shall not be higher than 9.9. If higher, subfloor must be neutralized.
- .3 Ensure that sub-floors have been provided as specified without holes, protrusions, cracks, depressions or other major defects.
- .4 Ensure that control joints have been filled and levelled.
- .5 Defective Work resulting from application to unsatisfactory surfaces will be considered the responsibility of those performing the Work of this Section.

3.2 SUBFLOOR TREATMENT

- .1 Flooring shall be installed over subfloors conforming to ASTM F710 for concrete.
- .2 Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with subfloor filler.
- .3 Apply sub-floor filler to low spots and cracks to achieve floor level to a tolerance of 1:1000, allow to cure.
- .4 Meet ASTM F710 Standard for Concrete or other monolithic floors.
- .5 Clean and remove deleterious materials from surfaces to receive Work in accordance with adhesive manufacturer's recommendations.
- .6 Prime concrete to flooring manufacturer's printed instructions.

3.3 RESILIENT SAFETY FLOORING APPLICATION

- .1 Install resilient sheet flooring in accordance with reviewed shop drawings and manufacturer's written instructions.
- .2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturers instructions. Do not spread more adhesive that can be covered by flooring before initial set takes place.

- .3 Run sheets in direction of traffic. Double cut sheet joints and continuously seal according to manufacturer's printed instructions. Remove adhesive seepage of seams or surface while adhesive is still wet.
- .4 Heat weld seams in accordance with ASTM F1516 and manufacturer's printed instructions.
- .5 As installation progresses and after installation, roll flooring with minimum 45 kg roller to ensure full adhesion.
- .6 Cut flooring neatly around fixed objects.
- .7 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .8 Install reducing edge strips at unprotected or exposed edges where flooring terminates or where there are two finishes of different thicknesses.
- .9 Drains: Fit safety flooring and mechanically fasten to drain outlets to ensure a permanent, watertight installation in accordance with manufacturer's written instruction.
- .10 Coved Installation: Where safety flooring is coved up wall surfaces and other abutments, installation shall be in accordance with manufacturer's written instructions.
- .11 Where existing safety flooring work has been damaged and where indicated on drawings, repair and clean flooring to the acceptance of the Consultant.

3.4 **CLEANING**

- .1 Forty-eight hours after installation, clean vinyl surfaces with a mild soap solution approved by finish manufacturer. Rinse clean and let dry.

3.5 **PROTECTION OF FINISHED WORK**

- .1 Protect floors from time of final set of adhesive until accepted by Consultant.
- .2 Prohibit traffic on floor for 48 hours after installation.
- .3 Cover cleaned surfaces with fibre reinforced, clean, non-staining clean, kraft paper. Secure in position with gummed tape to prevent drifting. Remove covering when directed by Consultant.

END OF SECTION

1 General

1.1 SECTION INCLUDES

- .1 Labour, Products, equipment and services necessary for epoxy flooring work in accordance with the Contract Drawings.

1.2 SUBMITTALS

- .1 Product data: Submit manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Two copies of manufacturer's Product data on characteristics, performance criteria, and limitations.
 - .2 Preparation, installation requirements and techniques, Product storage, and handling criteria.
- .2 Samples: Submit duplicate samples of each type and colour of epoxy flooring mounted on 250 x 200 mm hardboard in accordance with Section 01 00 00.
- .3 Reports: Submit manufacturer's acceptance of substrate prior to installation in writing. Submit verification of moisture content of floor prior to installation.
- .4 Close-out submittals: Submit maintenance data for incorporation into Operations and Maintenance manuals in accordance with Section 01 00 00.

1.3 QUALITY ASSURANCE

- .1 Perform work of this Section by a company that has a minimum of five years proven experience in installations of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator's current certificate of approval by the material manufacturer as proof of compliance.
- .2 Mock-up:
 - .1 Construct one 2 m² mock-up of epoxy flooring in location acceptable to Consultant.
 - .2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with work.
 - .3 Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.
 - .4 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.
- .3 Pre-installation meetings: Arrange with manufacturer's representative and Consultant to inspect substrates, and to review installation procedures 48 hours in advance of installation.

1.4 SITE CONDITIONS

- .1 Do not install the work of this Section outside of the following environmental ranges without Product manufacturer's written acceptance:
 - .1 Ambient air and surface temperature: 15°C to 30°C.
 - .2 Relative Humidity: In accordance with manufacturers' requirements.
 - .3 When no dust is being raised.
 - .4 In well-ventilated and broom clean areas.
- .2 Do not apply epoxy flooring over materials that contain over 4% moisture.
- .3 Install temporary protection and facilities to maintain the Product manufacturer's, and the above specification, environmental requirements for 24 hours before, during, and 24 h after installation.
- .4 Post do not enter and appropriate warning signs at conspicuous locations.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Package, seal and label each epoxy flooring material to show manufacturer's and product name, and colour.
- .2 Store materials at site in an area specifically set aside for purpose that is locked, ventilated, and maintained at a minimum temperature of 16°C.
- .3 Ensure that health and fire regulations are complied with in storage area, and during handling and application.

2 Products

2.1 MATERIALS

- .1 General:
 - .1 All materials under work of this Section, including but not limited to, primers and epoxy flooring are to have low VOC content limits.
 - .2 Each material used in the application of each flooring system shall be as recommended or manufactured by the supplier of the flooring system.
2. Epoxy flooring and base (**EF**):
 - .1 5 mm thick, decorative, slip resistant, trowelled system, consisting of trowelled mortar base, epoxy undercoat, coloured broadcasted quartz aggregate, and clear, UV resistant, epoxy sealer.
 - .2 Colour and finish texture: As selected by the Consultant from manufacturer's full range.
 - .3 Epoxy flooring 'Stonshield HRI' by Stonhard, Inc. complete with sealer 'Stonkote CE4' or approved alternative by BASF Canada Inc. or Sika Canada Inc.

- .3 Waterproof membrane: Liquid applied, urethane waterproofing membrane, 'Stonproof ME7' by Stonhard, Inc. or approved alternative by BASF Canada Inc. or Sika Canada Inc.
- .4 Primer: As recommended by manufacturer.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- .2 Verify that concrete floor has cured 28 days minimum and that substrate is acceptable to epoxy manufacturer.
- .3 Test surfaces for moisture content to ensure that they are suitable for application.

3.2 **PREPARATION**

- .1 Prepare substrate using steel aggregate blast method and vacuum substrate free of debris and dust.
- .2 Fill minor cracks and voids and prime surfaces in accordance with manufacturer's recommendations.
- .3 Protect adjacent surfaces from damage resulting from this work. Mask and/or cover adjacent surfaces, fixtures, and equipment as necessary.
- .4 Fill open control joints, and other cracks and voids with material compatible with epoxy materials.
- .5 Clean prime and seal surfaces as recommended by epoxy manufacturer.

3.3 **APPLICATION**

- .1 Apply waterproofing membrane to thickness and requirements as indicated in written instructions from epoxy manufacturer.
- .2 Apply epoxy flooring in accordance with manufacturer's printed instructions. epoxy manufacturer shall supervise application.
- .3 Stop epoxy in a straight line on each side of control joints; fill space over expansion joint with a self-levelling, non-sag polyurethane sealant.

- .4 Apply epoxy with care to ensure that no laps, voids, or other marks or irreg visible, and with an appearance of uniform colour, sheen and texture, all limitations of materials and areas concerned.
 - .5 Match colours and textures of approved samples.
 - .6 Make clean true junctions with no visible overlap between adjoining appli epoxy.
 - .7 Chase edge of adjacent floor systems so that epoxy finishes flush with ad systems.
 - .8 Provide 100 mm covered base at room perimeter and at built-in fitment loca cove with 25 mm radius.
- 3.4 **SITE TOLERANCES**
- .1 Finish surfaces shall be level, or straight where sloped to drains, within a 1.5 mm in 3 m, and shall not vary more than 0.8 mm in any running 300
- 3.5 **REPAIR**
- .1 Touch-up and refinish minor defective work. Refinish entire coated surfac where finish is damaged or otherwise unacceptable.
- 3.6 **CLEANING**
- .1 Remove promptly as work progresses spilled or spattered materials from work performed under other Sections. Clean floors on completion of work. surfaces while removing.
 - .2 Leave storage and mixing areas in same condition as equivalent spaces
- 3.7 **PROTECTION**
- .1 Erect barriers to prevent the entry and presence of personnel not perfor this Section during application of epoxy flooring, and for 48 hours following of application.

END OF SECTION

-
- 1 General
- 1.1 **SECTION INCLUDES**
- .1 Labour, Products, equipment and services necessary for hygienic wall cladding Work in accordance with the Contract Documents.
- 1.2 **SUBMITTALS**
- .1 Product data:
- .1.1 Submit duplicate copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
- .1.1 Performance criteria, characteristics, and limitations.
- .1.2 Product transportation, storage, handling and installation requirements.
- .2 Shop drawings: Submit shop drawings indicating elevations, sections, details, materials, dimensions, thicknesses, trim and accessory pieces, and interfacing with adjacent construction in accordance with Section 01 00 00.
- .3 Samples:
- .1.1 Submit following samples in accordance with Section 01 00 00.
- .1.1 Two 300 x 300 mm samples of wall cladding.
- .1.2 Two 300 mm samples of each trim and accessory proposed for use.
- .4 Certificates: Submit certification from material manufacturer that installation is in accordance with manufacturer's instructions.
- .5 Closeout submittals: Submit maintenance and cleaning instructions for incorporation into Operations and Maintenance Manuals in accordance with Section 01 00 00.
- 1.3 **QUALITY ASSURANCE**
- .1 Installers qualifications: Perform Work of this Section by a company that has a minimum of three years proven experience in the installation of wall cladding on projects of a similar size and nature and that is approved by manufacturer. Submit to Consultant, installer's current certificate of approval by the cladding manufacturer as proof of compliance.
- .2 Mock-up:
- .1.1 Construct one 2 m² mock-up of wall cladding system in location acceptable to Consultant.
- .1.2 Arrange for Consultant's and manufacturer's review and acceptance prior to start of installation.
- .1.3 Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.
- .1.4 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.

1.4 **SITE CONDITIONS**

- .1 Do not install Work of this Section outside of following environmental ranges without Consultant's and Product manufacturer's written acceptance:
 - .1 Ambient air and surface temperature: 15⁰C to 30⁰C.
 - .2 Relative Humidity: 45%.
- .2 Supply and install temporary protection and facilities to maintain Product manufacturer's, and above specified environmental requirements for 24 hours before, during, and 24 hours after installation.

2 Products

2.1 **MATERIALS**

- .1 All materials under Work of this Section, including but not limited to, sealants and adhesives are to have low VOC content limits.
- .2 Wall cladding (WP1):
 - .1 Extruded rigid PVC sheets, coloured throughout, smooth finish, Agriculture and Agri-Food Canada Approved, 2440 mm x 1220 mm x 2.5 mm thick. 'Altro Whiterock' by Altro or approved alternative.
 - .2 Wall cladding to come complete with thermoformed corners and all accessories required to provide a complete system.
 - .3 Colour: As selected by Consultant.
- .3 Adhesive and sealant: Types as recommended by cladding manufacturer to suit intended application.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 **PREPARATION**

- .1 Verify substrate surfaces are solid, free of moisture, dust, oil, grease, scaling or laitance, projections and any other foreign matter detrimental to performance. Obtain manufacturer's approval of substrate in writing, submit copy to Consultant.

3.3 **INSTALLATION**

- .1 Install wall cladding in accordance with reviewed shop drawings and manufacturer's written instructions.

- .2 Dry-fit sheet prior to fixing.
- .3 Bevel leading edges of sheet prior to fitting joint and cap strips.
- .4 Apply adhesive to back of sheet uniformly using a 4.5 mm 'V' notched trowel. Allow adhesive to dry tacky to the touch.
- .5 Offer sheet to wall substrate. Roll sheet thoroughly with a wall roller to ensure full adhesion.
- .6 Cut sheet neatly to accommodate pipes, electrical boxes, etc., providing a 3 mm gap for expansion.
- .7 Fit sheets neatly at door and window trim providing a 3 mm gap for expansion.
- .8 Thermoform all inside and outside corners and specific shapes to fit building contours.
- .9 Install joint strips to each sheet as installation progresses.
- .10 Provide water tight seal to all pipes, projections, door and window trims with sealant.

3.4 CLEANING

- .1 Upon completion of installation, remove the protective film and wash with a dilute soap/detergent solution and rinse with clean water.

END OF SECTION

-
- 1 General
 - 1.1 **SECTION INCLUDES**
 - .1 Labour, Products, equipment and services necessary for painting Work in accordance with the Contract Documents.
 - 1.2 **REFERENCES**
 - .1 CAN/CGSB 85.10, Protective Coatings for Metals.
 - .2 CAN/CGSB-85.100, Painting.
 - .3 Master Painters Institute (MPI), Painting Specification Manual.
 - .4 SSPC Steel Structures Painting Council, Standards.
 - 1.3 **SUBMITTALS**
 - .1 Product data:
 - .1 Submit copies of manufacturer's Product data in accordance with Section 01 00 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Submit listing of manufacturer's Product types, Product codes, and Product names, number of coats, and dry film thicknesses, corresponding to each Painting Schedule code; submit listing minimum of 8 weeks before materials are required.
 - .2 Samples:
 - .1 Submit following samples in accordance with Section 01 00 00.
 - .1 Three 300 x 150 mm draw downs of each colour minimum 4 weeks before paints are required.
 - .2 Identify each sample with Contract number and title, colour reference, sheen, date, and name of applicator.
 - .3 Certificates:
 - .1 Submit certification from paint manufacturer, on company letterhead, indicating each product proposed for use is Manufacture's premium grade, first line Product.
 - .2 Submit certified documentation to confirm each airless spray painter has minimum of 5 years experience on applications of similar complexity and scope.
 - .3 Submit certified documentation to confirm each worker has Provincial Tradesman Qualification certificate of proficiency.

- .4 Reports:
 - .1 Submit written field inspection and test report results after each inspection.
 - .2 Submit Field Quality Control test result reports for alkali content, substrate moisture, and dry film thickness.
 - .3 Submit electronic moisture meter manufacturer's specifications including tolerances. Submit record of latest meter calibration to meet manufacturer's recommendations.

1.4 QUALITY ASSURANCE

- .1 Finishing Work: Perform work to MPI requirements for premium grade.
- .2 Supervision: Have Work supervised by a full-time qualified foreperson who has 10 years minimum experience on Contracts of similar complexity and scope.
- .3 Mock-up:
 - .1 Construct three 10 m² mock-ups of different Paint Schedule code systems, selected by Consultant, in locations acceptable to Consultant to demonstrate installation workmanship, colour, and hiding power of Products.
 - .2 Obtain Consultant's acceptance in writing before proceeding with the Work of this Section.
 - .3 Mock-ups may remain as part of the Work if acceptable to Consultant and will serve as a standard for similar code systems.
 - .4 Repaint over mock-ups which do not form part of the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Install correct, safe temporary storage for paint, thinner, solvents, and other volatile, corrosive, hazardous, and explosive materials in accordance with requirements of authorities having jurisdiction.
- .2 Post hazard warning signage in areas of storage and mixing. Install and maintain sufficient CO₂ fire extinguishers of minimum 9 kg capacity, accessible in each storage mixing and storage areas.
- .3 Maintain storage enclosures at minimum 10°C ambient temperature and to manufacturer's instructions.

1.6 SITE CONDITIONS

- .1 Apply coatings under the following conditions:
 - .1 Exterior coatings (except Latex): 5°C minimum.
 - .2 Exterior latex coatings: 10°C minimum.
 - .3 24 hours minimum after rain, frost, condensation, or dew.
 - .4 When no condensation is possible (unless specifically formulated against condensation).
 - .5 Interior coatings: 7°C minimum.
 - .6 Relative humidity: 85% maximum.
 - .7 Not in direct exposure to sun light.

- .2 Maintain temperature conditions indicated above for 24 hours before, during and 24 hours after painting.
- .3 Install clean plywood sheets to protect floors and walls in storage and mixing areas, from paint drips, spatters, and spills.
- .4 Apply sufficient masking, clean drop cloths, and protective coverings for full protection of Work not being painted including, but not limited to, the following:
 - .1 Light fixtures, fire and smoke detectors.
 - .2 Sprinkler heads.
 - .3 Prepainted diffusers and registers.
 - .4 Prepainted equipment.
 - .5 Fire rating labels and equipment specification plates.
 - .6 Finished surfaces.

1.7 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

- 1. Provide paint products meeting MPI "Green Performance Standard GPS-1-05".

1.8 MAINTENANCE

- 1. Deliver to Owner's place of storage on completion of work, sealed containers of each finish painting material applied, and in each colour. Label each container as for original, including mixing formula. Provide the following:
 - .1 1 L of extra materials when less than 50 L are used for Project;
 - .2 3.78 L of extra stock when 50 to 200 L are used;
 - .3 7.57 L of extra stock when over 200 L are used.

2 Products

2.1 MATERIALS

- .1 Paint:
 - .1 All materials under Work of this Section, including but not limited to, primers, stains, and paints are to have low VOC content limits.
 - .2 Products in accordance with the MPI Painting Specification Manual, Exterior and Interior Systems;
 - .1 For each MPI paint code, manufacture's premium grade, first line Products is to be use.
 - .2 Uniform dispersion of pigment in a homogeneous mixture.
 - .3 Ready-mixed and tinted whenever possible.
 - .3 Products within each MPI paint system code: From single manufacturer.
 - .4 Acceptable manufacturers:
 - .1 Benjamin Moore.
 - .2 Dulux Paints/PPG.
 - .3 Para Painting & Coatings.
 - .4 Sherwin Williams.

2.2 COLOUR SCHEDULE

- .1 Consultant will select choice of colours and gloss when compiling a Colour Schedule after award of Contract; allow for colour selection beyond paint manufacturer's standard colour range.
- .2 Conform to gloss reflectance definitions listed in MPI Specification Manual.

2.3 PAINTING AND FINISHING SCHEDULE

- .1 Refer to Table 1, MPI Painting and Finishing Schedule coded systems, comply with MPI Painting Specification Manual.

Table 1: Painting and Finishing Schedule				
EXTERIOR SUBSTRATES	Typical substrates (Including but not limited to)	MPI Manual Ref.	MPI Finish System Code	Topcoat
Metal fabrications		EXT 5.1	EXT 5.1D	Alkyd
Galvanized steel	HM doors & frames, handrails, bollards, pipes, etc.	EXT 5.3	EXT 5.3B	Alkyd
INTERIOR SUBSTRATES	Typical substrates (Including but not limited to)	MPI Manual Ref.	MPI Finish System Code	Topcoat
Concrete walls and ceilings		INT 3.1	INT 3.1A	Latex
Concrete block masonry		INT 4.2	INT 4.2A	Latex
Metal Fabrications (Factory primed)	Steel stairs, ladders, etc.	INT 5.1	INT 5.1R	High performance latex
Galvanized steel	Ducts, pipes, metal deck	INT 5.3	INT 5.3A	Latex
Galvanized metal	HM doors & door frames, handrails	INT 5.3	INT 5.3B	WB light industrial coating

Table 1: Painting and Finishing Schedule				
Dressed lumber	Doors and frames requiring paint finish	INT 6.3	INT 6.3A	High performance latex
Dressed lumber	Doors and frames requiring stain finish	INT 6.3	INT 6.3D	Alkyd varnish
Gypsum board,	Drywall, walls, ceilings	INT 9.2	INT 9.2B	High performance latex
Gypsum board,	Wet areas	INT 9.2	INT 9.2F	Epoxy-modified latex

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

3.2 **PREPARATION**

- .1 General:
 - .1 Clean substrate surfaces free from, dust, grease, soiling, or extraneous matter, which are detrimental to finish.
 - .2 Patch, repair, and smoothen minor substrate defects and deficiencies e.g. machine, tool and sand paper marks, shallow gouges, marks, and nibs.
 - .3 Clean, sweep, and vacuum floors and surfaces to be painted, debris and dust-free prior to painting.
 - .4 Refer to MPI Painting Specification Manual for surface preparation requirements of substrates not listed here.
- .2 Where finish hardware has been installed remove, store, re-install finish hardware, to accommodate painting. Do not clean hardware with solvent that will remove permanent lacquer finishes.
- .3 Alkali Content tests and neutralization:
 - .1 Test for ph level using litmus paper on dampened substrate.

-
- .2 Neutralize surfaces over 8.5 ph with 4% solution of Zinc Sulphate for solvent based systems and tetrapotassium pyrophosphate for latex based systems, to below 8.0 ph, and allow to dry.
 - .3 Brush-off any residual Zinc Sulphate crystals.
 - .4 Coordinate paint system primer / sealer to be alkali-resistant.
 - .4 Substrate moisture tests:
 - .1 Test for moisture content over entire surface to be painted, minimum one test/ 2 m² in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.
 - .2 If any test registers above 10% allow entire substrate surfaces, within the plane, to dry further before paint system application. Install temporary drying fans if necessary.
 - .3 Re-test employing same criteria.
 - .5 Mildew removal: Scrub with solution of trisodium phosphate and sodium hypochlorite (Javex) bleach, rinse with water, and allow to dry completely.
 - .6 Cementitious and masonry (existing): Clean existing surfaces by pressure washing where indicated on drawings with a TSP solution and pressure range of 1500 - 4000 PSI at 6 - 12". Rinse areas with clean water and allow to thoroughly dry. Provide for collection and disposal of water.
 - .7 Cementitious and masonry (Concrete, block, brick, cement rendering):
 - .1 Allow 28 days cure before painting.
 - .2 Coordinate repair of protrusion-chipping and grinding, and honeycomb filling with responsible trades.
 - .3 Remove dirt, loose mortar, scale, powder, efflorescence, and other foreign matter.
 - .4 Remove form oil and grease with trisodium phosphate, rinse, and allow to dry thoroughly.
 - .5 Prepare surfaces in accordance with CAN/CGSB-85.100.
 - .6 Remove rust stains with solution of sodium metasilicate after thorough wetting; allow to dry thoroughly.
 - .8 Concrete floors (existing): Clean existing surfaces by pressure washing where indicated on drawings with a TSP solution and pressure range of 1500 - 4000 PSI at 6 - 12". Rinse areas with clean water and allow to thoroughly dry. Provide for collection and disposal of water.
 - .9 Concrete floors (new):
 - .1 Allow 28 days cure before painting.
 - .2 Remove contamination, acid etch, rinse with water, and allow to dry completely. Test and adjust for neutral ph.
 - .3 Prepare surfaces in accordance with CAN/CGSB-85.100 acid etch.
 - .10 Metal Fabrications (existing): Scrape and either hand or power wire brush surfaces to remove mill and scale.

- .11 Galvanized steel sheet:
 - .1 Z275 (Satin & Spangled Sheet): SSPC SP7 brush blast.
 - .2 ZF075 (Wiped Coat): Remove contamination, wash with Xylene solvent.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.

- .12 Galvanized iron and steel: Prepare galvanized and ungalvanized metal surfaces according to CAN/CGSB-85.10.
 - .1 Unpassivated, unweathered and weathered: Remove contamination, wash with Xylene or Toluol solvent, allow to dry thoroughly. Make paint system primer/sealer an etching type primer.
 - .2 Manufacturer pre-treated (including passivated): SSPC SP7.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.

- .13 Structural steel and miscellaneous metal fabrications:
 - .1 Coordinate the following with the responsible trades:
 - .1 Rust, mars, mill scale, and weld-burn touch-ups.
 - .2 Oil, grease, weld flux and other residue removal.
 - .2 Prime paint items, not otherwise indicated to be primed as part of another Section.
 - .3 Touch-up damaged galvanized areas with organic zinc rich primer.

- .14 Wood (existing):
 - .1 Rough woods: brush surface free of all dirt, dust and foreign matter with a wire brush.
 - .2 Smooth woods: brush surfaces with a stiff fibre brush to remove dirt, dust etc.

- .15 Wood and Millwork:
 - .1 Wood surfaces to be clean and dry with a moisture content of less than 15%.
 - .2 Remove foreign matter prior to prime coat; spot coat knots, pitch streaks and sappy sections with sealer.
 - .3 Fill nail holes and fine cracks after primer has dried.
 - .4 Backprime interior and exterior woodwork.

- .16 Factory primed surfaces:
 - .1 Touch up damaged areas.
 - .2 Clean as required for top coat.

- .17 Gypsum board (existing):
 - .1 Remove dust, dirt, oil, grease, glue and all foreign material. Clean with stiff fibre brush prior to applying primer coat.
 - .2 Coordinate repairs and touch-ups with the responsible trade.
 - .3 Lightly sand surface to smooth out ridges and provide neat smooth surface.

- .18 Gypsum board:
 - .1 Apply primer/sealer paint to reveal defects and deficiencies and to equalize absorption areas.
 - .2 Coordinate repairs and touch-ups with the responsible trade.
 - .3 Re-prime repairs.

- .19 Coordinate with other trades to prevent:
 - .1 Damage, and inadvertent activation of fire and smoke detectors.
 - .2 Odour and dust distribution by permanent HVAC systems including fouling of ducts and filters.
- .20 Field-mix Products in accordance with manufacturer's written instructions.

3.3 APPLICATION

- .1 Apply painting systems in accordance with the MPI Painting Specification Manual. Apply each Product to manufacturer's recommended dry film thickness.
- .2 Painting systems listed are required minima, apply additional coats if necessary to obtain substrate hiding acceptable to the Consultant.
- .3 Tint intermediate coats lighter than final top coats for identification of each succeeding coat and to facilitate inspections. Include only manufacturer's recommended reducing and tinting accessories. Do not add adulterants.
- .4 Primer to be specialized primer coating system as required by manufacturer for selected colour. Standard primer being tinted shall be tinted to a maximum of 1.5% by volume.
- .5 Sand lightly between coats to achieve a tooth or anchor for subsequent coats.
- .6 Apply paint uniformly in thickness, colour, texture, and gloss, as determined by the Consultant under adequate illumination and viewed at a distance of 1500 mm. Apply finishes free of defects in materials and application which, in the opinion of the Consultant, affect appearance and performance. Defects include, but are not limited to:
 - .1 Improper cleaning and preparation of surfaces.
 - .2 Entrapped dust, dirt, rust.
 - .3 Alligatoring, blisters, peeling.
 - .4 Scratches, blemishes.
 - .5 Uneven coverage, misses, drips, runs, and poor cutting in.
- .7 Do not apply coatings on substrates which are not sufficiently dry. Unless indicated otherwise, allow each painting system coat to cure dry and hard before following coats are applied.
- .8 Repaint entire areas of damaged or incompletely covered surfaces, to the nearest inside or outside corner; patching will not be permitted.
- .9 Miscellaneous painting requirements:
 - .1 Paint projecting ledges, and tops, bottoms and sides of doors both above and below sight lines to match adjacent surfaces.
 - .2 Paint door frames, access doors and frames, door grilles, prime coated butts, and prime coated door closers to match surface in which they occur.
 - .3 Finish closets and alcoves as specified for adjoining rooms.

- .4 Paint light covers white whether a light lense is installed or not, unless otherwise indicated.
- .5 Paint interior columns to match walls of room.
- .6 Allow for:
 - .1 2 wall colours per room, one ceiling colour per room.
 - .2 Different door colours in each functionally different area.
 - .3 Different colours on both sides of same door.
- .10 Mechanical, electrical and other painting coordination:
 - .1 Paint mechanical services in accordance with Mechanical Identification Division 21, 22 and 23.
 - .2 Coordinate painting of pipes, ducts, and coverings with the Work of Division 21, 22 and 23 to precede pipe colour banding, flow arrows, and other pipe identification labeling installation.
 - .3 Paint exposed conduit, pipes, hangers, ductwork, grilles, gratings, louvres, access panels, fire hose cabinets, registers, convector and radiator covers, enclosures, and other mechanical and electrical equipment including services concealed inside cupboard and cabinet Work; apply colour and sheen to match adjacent surfaces, except as noted otherwise.
 - .4 Paint portions of surfaces such as duct interiors, piping, ductwork, hangers, insulation, walls, and similar items, visible through grilles, louvres, convector covers etc., matte black in colour.
 - .5 Remove the following to accommodate painting, carefully store, clean, then re-install on completion of each area and when dry:
 - .1 Switch and receptacle plates, fittings and fastenings, grilles, gratings, louvres, access panels, convector covers, and enclosures.

3.4 FIELD QUALITY CONTROL

- .1 Dry film thickness tests:
 - .1 Test for film thickness over entire surface to be painted, minimum one test/2 m² in field areas and one test/600 mm along inside corners including at ceiling to wall juncture.
 - .2 If any test registers below specified thickness, re-apply paint to entire surface to nearest inside and outside corners.
 - .3 If test registers more than 50% above specified thickness, consult with paint manufacturer, determine if problem exists, offer solutions to Consultant, and repair as directed.
 - .4 Re-test employing same criteria after repair.

3.5 CLEANING

- .1 Remove spilled, splashed, and spattered paint promptly as Work proceeds and on completion of Work. Clean surfaces soiled by paint spillage and paint spatters. Repair or replace damaged Work, as directed by Consultant.

3.6 PROTECTION

- .1 Post Wet Paint signs during drying and restrict or prevent traffic where necessary.

- .2 Post sign, after Consultant's inspection and acceptance of each room, reading:
PAINTING COMPLETE - NO ADMITTANCE WITHOUT CONTRACTOR'S
PERMISSION.

END OF SECTION

FORBO ARMORCOVE™ TECHNICAL DATA

1. PRODUCT NAME & MANUFACTURER

1.1 Product:

Forbo ArmorCove™ cove assembly with Marmoleum®

1.2 Manufacturer:

Forbo Flooring Systems
Humboldt Industrial Park
Hazleton, PA 18202

www.forboflooringNA.com

Phone: +1-800-842-7839 (US)

+1-800-268-8108 (CA)

Fax: +1-570-450-0258

1.3 Product Description:

Construction: Forbo ArmorCove™ is a fully integrated coving system that is comprised of a 1-piece aluminum cove-former, full vertical backing and cap, with Marmoleum® as the finished surface. It is puncture-proof and water resistant.

1.4 Physical Characteristics:

(dimensions are approximate)

Gauge----- 0.13" (3.30 mm)

Height ----- 4.25" (10.80 cm) or 6.25" (15.88 cm)

Length ----- 10' (3.048 meters)

Toe Width----- 3" (7.62 cm)

Backing ----- Aluminum

Cove Radius ----- 5/8" (1.59 cm)

Packaging----- 4.25": 10 pieces (100 lin. ft, 30.48 m)

----- 6.25": 8 pieces (80 lin. ft, 24.38 m)

2. PRODUCT PERFORMANCE & TECHNICAL DATA

2.1 Environmental:

Compliant with CDPH 01350 requirements for VOC emissions and indoor air quality.

Forbo ArmorCove™ contributes to LEED® v4 credits. For additional information, contact Forbo Flooring Systems.

2.2 Resistance to Bacteria:

Provides a self-sanitizing quality in the form of a bacteriostatic effect. Independent testing has shown that a sterile zone around the Marmoleum® inhibits the growth of organisms.

2.3 Anti-Static Properties:

Marmoleum® is naturally anti-static. This property makes cleaning easier because dirt and dust does not cling to the surface as it may with other materials.

2.4 Cigarette Resistance:

Marmoleum® resists cigarette burns. Burning cigarettes will leave only a brown mark which can be rubbed out using steel wool or a scouring pad.

2.5 Fire Testing:

Class 1 when tested in accordance with ASTM E 648/ NFPA 253, Standard Test Method for Critical Radiant Flux. Meets 450 or less when tested in accordance with ASTM E 662/NFPA 258, Standard Test Method for Smoke Density.

FSR – 120; SDC – 200 when tested in accordance to CAN/ULC S102.2, Standard Test Method for Flame Spread Rating and Smoke Development of Flooring Materials.

3. INSTALLATION

3.1 Adhesive:

Use Forbo ArmorFix™ adhesive.

3.2 Installation Guidelines:

It is recommended to account for an additional 12" (30.48 cm) in length for each inside and outside corner for waste during fitting.

Refer to Forbo's Installation Guidelines for complete installation recommendations.

3.3 Heat Welding Is Not Required:

Forbo Marmoweld... EZ to use is a color-matched sealant used to complete the installation of Forbo ArmorCove™ in place of heat welding. To use, sparingly apply Forbo Marmoweld... EZ to use to all inside and outside corners as well as the seams on the floor with a 1" (2.54cm) putty knife or plastic applicator. Ensure there are no sharp or damaged edges on the applicator that might scratch or damage the Forbo Marmoleum®. Wipe all excess Forbo Marmoweld... EZ to use off the surface of the Forbo Marmoleum® with a clean, damp white cloth.

4. WARRANTY

Limited lifetime puncture warranty. For complete details, contact Forbo Flooring Systems.

5. CARE & CLEANING

Refer to Forbo's Floor Care Guidelines for complete care recommendations.

FORBO MARMOWELD ETU TECHNICAL DATA

1. PRODUCT NAME & MANUFACTURER

1.1 Product:

Forbo Marmoweld ETU seam weld

1.2 Manufacturer:

Forbo Flooring Systems
Humboldt Industrial Park
Hazleton, PA 18202

www.forboflooringNA.com

Phone: +1-800-842-7839 (US)
+1-800-268-8108 (CA)

Fax: +1-570-450-0258

1.3 Physical Characteristics:

Environment----- FloorScore Certified
Safety ----- 100% Solvent and Ammonia Free
----- Non-Flammable
Storage ----- Do NOT Freeze
Shelf Life ----- 2 years in unopened container
VOC Emissions----- 0 g/L (per SCAQMD Rule 1168)
Odor----- Little to no odor
Spread Rate ----- 1,200 linear feet
Unit Size----- 8 oz. (236.59 mL)

2. INSTALLATION

2.1 General Guidelines:

Forbo Marmoweld ETU is the preferred method of welding seams where seamless or monolithic flooring is required. Forbo Marmoweld ETU is a color-coordinating paste weld which can also be used to make minor repairs in Forbo Marmoleum® products. Forbo Marmoweld ETU should never be diluted or mixed with any other sealants.

Forbo Marmoweld ETU is only for use with Forbo Marmoleum® products.

Due to the developments and advancements made over the last decades with the combination of Forbo Marmoleum® TopShield2™ (Forbo's factory finish for Marmoleum®), improvements in water-based adhesives, and with our commitment to education of proper installation, care and maintenance procedures and environmental stewardship; heat welding is **no longer necessary for most applications.**

Material should always be visually inspected prior to installation. If there are any questions regarding the quality of material, contact your local Forbo representative or Forbo Product Support & Education Services PRIOR to installation.

2.2 Tools Required:

Clean, white, lint-free cloths, clean buckets, and clean, cool water.

2.3 Application – Using Forbo Marmoweld ETU for Welding 1.0mm Prepared Seams:

Always apply Forbo Marmoweld ETU immediately upon the completion of installed seams. Delaying the application of the product increases the chances of seam contamination.

Carefully clean all excess adhesive from within the 1mm prepared seam before applying Forbo Marmoweld ETU. This must be done while the adhesive is still wet and can be accomplished using the edge of the Forbo Marmoweld ETU applicator card.

Remove all loose debris from the surface of the flooring material by sweeping or vacuuming. Remove any residual adhesive from the surface with a clean, white, lint-free cloth and clean, cool water prior to applying Forbo Marmoweld ETU.

Carefully apply Forbo Marmoweld ETU directly into the 1mm prepared seam with the applicator card. Work in manageable sections of 3 feet to 5 feet at a time by carefully pushing Forbo Marmoweld ETU into and across the seam.

Remove excess wet Forbo Marmoweld ETU from the sides of the seam with the applicator card.

Let the welded seam dry for a minimum of 30 minutes.

Carefully wipe off any Forbo Marmoweld ETU residue from the sides of the welded seam with a clean, white, lint-free damp cloth. Repeat this process as necessary, making sure that only clean cloths and water are being used so residue from unclean water or cloths is not being spread.

IMPORTANT! Change water and cloths frequently to eliminate spreading weld residue over the surface of the floor. Clean water and cloths will help reduce further cleanup after the Forbo Marmoweld ETU has dried.

After application and cleaning is complete, carefully inspect that there are no voids or low spots. Re-apply Forbo Marmoweld ETU as necessary so the final seam is free of voids or low spots. If reapplication is required, let the welded seam dry for a minimum of 30 minutes, then carefully wipe off any Forbo Marmoweld ETU residue from the sides of the welded seam with a clean, white, lint-free damp cloth. Repeat this process as necessary, making sure that only clean cloths and water are being used so residue from unclean water or cloths is not being spread.

Ensure that **ALL** Forbo Marmoweld ETU residue is removed from the surface of the flooring material.

Once Forbo Marmoweld ETU seams are completed, allow a minimum of an additional 30 minutes before damp mopping. Do NOT flood the floor or conduct wet maintenance for a minimum of 24 hours. Refer to Forbo Flooring's Installation Guide for complete installation guidelines of Marmoleum®.

Dried Forbo Marmoweld ETU residue on the surface of the material can easily be removed with clean, cool water and a clean, white, lint-free cloth within 8 hours. To remove residue after 8 hours: use a properly diluted neutral pH cleaner with a 10-minute dwell time, then use a swing machine with a 3M™ #5100 pad, pick up that solution, and follow with a clean water rinse.

2.4 Application – Using Forbo Marmoweld ETU for Repairs:

Sparingly apply Forbo Marmoweld ETU to areas requiring minor repairs such as gaps at seams or perimeters with the Forbo Marmoweld ETU applicator card.

Remove any excess Forbo Marmoweld ETU from the surface of the floor using the Forbo Marmoweld ETU applicator card.

Let the repaired area dry for a minimum of 30 minutes.

Carefully wipe off any Forbo Marmoweld ETU residue from the sides of the repair with a clean, white, lint-free damp cloth. Repeat this process as necessary, making sure that only clean cloths and water are being used so residue from unclean water or cloths is not being spread.

IMPORTANT! Change water and cloths frequently to eliminate spreading weld residue over the surface of the floor. Clean water and cloths will help reduce further cleanup after the Forbo Marmoweld ETU has dried.

After application and cleaning, carefully inspect that there are no voids or low spots. Re-apply as necessary so the final repair is free of voids or low spots. If reapplication is required, let the repaired area dry for a minimum of 30 minutes, then carefully wipe off any Forbo Marmoweld ETU residue from the sides of the welded seam with a clean, white, lint-free damp cloth. Repeat this process as necessary, making sure that only clean cloths and water are being used so residue from unclean water or cloths is not being spread.

Ensure that **ALL** Forbo Marmoweld ETU residue is removed from the surface of the flooring material.

Once Forbo Marmoweld ETU repairs are completed allow a minimum of an additional 30 minutes before damp mopping. Do NOT flood the floor or conduct wet maintenance for a minimum of 24 hours. Refer to Forbo Flooring's Installation Guide for complete installation guidelines of Marmoleum®.

IMPORTANT! Forbo Marmoweld ETU is intended for minor repairs. It is not intended to fill large gaps or to fix poor installations. The size of the repair will affect the yield of the Forbo Marmoweld ETU. Some repairs may require additional applications to ensure there are no low spots or voids. No weld is intended to correct issues of deficient installation.

3. WARRANTY

Limited warranty. For complete details, contact Forbo Flooring.

4. CARE & CLEANING

See Forbo Flooring's Floor Care Guide for additional information.