Engineers

ST. FRANCIS XAVIER CATHOLIC ELEMENTARY SCHOOL

CHIMNEY DEMOLITION

298 Hwy 8, Stoney Creek, ON L8G 1E6

BID DOCUMENTS, TECHNICAL SPECIFICATIONS, AND DRAWINGS

Prepared for:

Hamilton Wentworth Catholic District School Board
90 Mulberry St. Hamilton, ON L8R 2C8

Prepared by:

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RJC No. TOR.143567.0001

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Division 00 - Procurement and Contracting Requirements

Division 01 - General Requirements

Division 02 - Existing Condition

Division 03 - Concrete

Division 07 - Thermal and Moisture Protection

Division 09 - Finishes

Division 26 - Electrical

1.0 Drawings

The drawings listed below will be included in the General Contractor/Owner agreement and will become part of the contract.

Drawing No.	Drawing Title	Date
	Cover Page & General Notes	January 14, 2026
S1	Site Plan	January 14, 2026
S2	South Elevation	January 14, 2026
S3	Sections & Details	January 14, 2026

END OF SECTION

1.0 GENERAL

Work under this Contract includes removal of the existing chimney on the building roof level along with associated localized exterior concrete wall repairs and roofing repairs at St Francis Xavier Catholic Elementary School, in the City of Hamilton in the Province of Ontario.

1.1 Description of Existing Structure

St. Francis Xavier Catholic Elementary School is an elementary school operated by Hamilton-Wentworth Catholic District School Board in the community of Stoney Creek (City of Hamilton), Ontario. The property is owned and operated by the Hamilton-Wentworth Catholic District School Board. The site is situated within a predominantly residential area and has direct frontage onto Highway 8, a major east-west arterial roadway. The school consists of a low-rise institutional building typical of mid-20th century Ontario school construction. The structure is understood to be primarily of masonry and concrete construction, with flat or low-slope roof assemblies characteristic of schools constructed during this era.

Towards the north side of the building there is a protruding concrete chimney extending from a lower roof at an area of the building which is 1-storey. The chimney extends past an adjacent area of the building which is 2-storeys and is approx. 6 feet above the parapet wall of the roof of the building. The chimney is located on the exterior face of the building and has a rectangular shape.

1.2 Description of Work

.1 It is the Contractor’s responsibility to provide all labour, material, equipment and supervision to complete the repairs outlined in this specification taking into account all site conditions, noise restriction, work area restrictions, protection requirements, accessibility restrictions, etc. No extras will be entertained for inconveniences after the award of this Contract.

.2 In particular, the work includes but is not necessarily limited to the following:

.1 The installation and maintenance of hoarding, dust protection, and construction signage around each phase of work as described in Section 01 56 00 – Protection of Work and Property.

.2 Removal and disposal of the existing chimney on the building roof level, to the level of the lower roof.

.3 Localized concrete repair of the existing wall behind the existing chimney & infill of the roof slab, once the existing chimney has been removed.

.4 Localized modified bitumen roofing membrane and metal flashing repairs, once the existing chimney has been removed.

.5 Repair of all areas damaged by construction activity; specifically, the Contractor shall repair all damage resulting from the Construction to the satisfaction of the Consultant including repainting of surfaces that have been damaged in accordance with these Specifications.

.6 Final cleaning of structure, fixtures, piping, etc., and the disposal all waste products and/ or debris generated by the construction activity as well as any material present in the work area prior to the commencement of the Work. The areas requiring cleaning shall consist of all areas affected by the Work.

1.3 Work Sequence

.1 The Work areas will be available, time to be determined by the Owner.

.2 Subject to adjustments in Contract Time agreed upon by Change Order, attain Substantial Performance of the Work as per agreement with the Board.

1.4 Phasing of Work

.1 In order to successfully complete the proposed repairs while minimizing the disruption to the school, the work may be completed in a single phase.

1.5 Construction Schedule

.1 In conjunction with and in a form acceptable to the Consultant and Owner, provide within (5) working days after award of contract a detailed schedule indicating the following parameters.

.1 Start date and completion date for each Phase of the work.

.2 Start and completion dates for concrete repairs for each phase of work based on estimated quantities in Bid Form.

.3 Daily and weekly schedule for labour and equipment, hours of operation, and crew sizes.

.2 The construction schedule shall reflect completion of all work under the Contract within the specified time and in accordance with these Specifications.

.3 If the Contractor desires to make a major change in the method of operation after commencing construction, or if the schedule fails to reflect the actual progress, the Contractor shall submit to the Consultant a revised construction schedule in advance of beginning revised operation.

END OF SECTION

1.0 GENERAL

1.1 Contractor's Use of Site

.1 Building is to remain open throughout the course of the Work. Contractor has complete and sole use and access to designated work areas, from 8:30a.m. to 5:00p.m. unless otherwise stipulated by the Owner during the course of the Work. Access to other areas of building is not permitted unless supervised by representatives of Owner.

.2 Coordinate work schedule with the Owner to minimize disruption of the site and building . No work shall be performed until approved by Owner.

.3 It is Contractor's responsibility to ensure the building remains operational at all times and to perform work as required to keep exits and entrances available to building users at all times.

.4 Provide the Owner with a schedule that lists all parking spaces to be occupied or restricted at least five (5) working days prior to occupying or restricting those spaces.

.5 It is Contractor's responsibility to control traffic and to redirect if necessary to allow access to building areas outside of work area. Any required traffic rerouting and work sequence shall be closely coordinated with the Owner.

.6 Provide signage of professional quality, barriers, and hoarding as necessary to protect the public from construction and Contractor operations, to secure the work area, and to route traffic through or around designated work areas. Provide signage at each entrance indicating that repairs are being performed and we are sorry for the inconvenience. Refer to Drawings and Section 01 56 00 for a list and locations of non-standard construction signage that must be supplied by the Contractor. These signage requirements are in addition to any standard signs required to control and reroute traffic or maintain public safety.

.7 Hoarding and dust protection is to be provided around each area of work in accordance with Section 01 56 00. Each phase of work is to be sealed to prevent the release of construction dust into other areas.

.8 Completely enclose and ventilate work areas (fresh air in and exhaust out) without allowing dust to escape from the work area. Exhaust system must filter dust out of the air before it is released into the atmosphere. All exhaust systems must be filtered and directed to the outside through ducting, which is to be installed in a manner acceptable to the Owner and Consultant. Clean and replace filters regularly.

.9 Implement temporary measures to maintain interior air quality, temperature, and ventilation during performance of the Work.

.10 Use of power plant and percussive equipment to be in accordance with all local by-laws and ordinances.

.11 Confine construction equipment, temporary work, storage of products, waste products and debris, and operations of employees and subcontractors to limits indicated by laws, ordinances, permits, or Contract Documents and do not unreasonably encumber the Place of the Work.

.12 Do not close, obstruct, or store materials in roadways, sidewalks, or passageways without prior approval from the Owner. Do not interfere with safe passage to and from building and adjacent public sidewalks and roads.

.13 Maintain access to stairwells and elevator shafts. Under no circumstances shall these areas be obstructed unless otherwise approved by Owner.

.14 Move stored products or equipment that interfere with operation of the building, Owner, or residents.

.15 Obtain and pay for all necessary approvals to locate equipment or materials on city property, excluding building permit.

.16 Protect existing light standards, walls, plants, finishes, windows, doors, etc.

.17 Protect all utilities, gas mains, electrical conduit, etc. that must remain in service throughout the construction period.

.18 During transportation of materials or equipment through occupied areas, protect the public, property, and finishes from damage. All damage caused by the Contractor is to be repaired or rectified at Contractor’s expense.

.19 Make allowance in price to cover all costs of temporary removal and replacement or relocation of existing electrical wiring and mechanical hardware required for completion of the Work.

.20 Propane powered equipment is not permitted within interior areas.

.21 Temporary heat and ventilation used during construction – including the cost of installation, fuel, operation, maintenance, and removal of equipment – shall be paid for by the Contractor. Use of direct-fire heaters discharging waste products into work areas is not permitted.

.22 Disposal bins, supply trucks, etc. are to be located in a location agreed upon with the Owner. Contractor is responsible for all required permits.

.23 Maintain free access routes for ambulance, fire emergency vehicles, garbage trucks, etc.

1.2 Hours of Work

.1 Use of all equipment to be restricted in accordance with local and municipal noise by-laws and regulations.

.2 All noise generating Work shall be limited to the hours of **8:30 A.M to 5:00 P.M.** Monday through Friday, **No noise generating work permitted** on Saturdays, Sundays, and holidays.

.3 Every two weeks, an updated schedule will be provided for hours of noise generating work that are permitted beyond the hours stated above.

1.3 Effect on Building and Site

.1 Schedule operations to minimize interruption of the normal use of the site and building, and to comply with laws, by-laws, ordinances, rules, and regulations relating to the Work.

.2 Locate all existing utilities prior to construction and protect them during construction.

END OF SECTION

1.0 GENERAL

1.1 Section Includes

.1 Contingency Allowances

.2 Determination of Actual Costs

.3 Adjustment of Contract Price

1.2 Allowances

.1 Allowances include for the following:

.1 Contingency

.2 Unless otherwise specified, amounts for each allowance include:

.1 Actual product cost

.2 Applicable taxes and tariffs

.3 Freight, handling, unloading, and storage

.4 Contractor services

.5 Labour for installation and finishing

.6 Construction machinery and equipment

.7 Authorized expenditures

.3 Value Added Taxes do not form a part of the allowances.

.4 Contractor’s overhead and profit to be included as follows:

.1 Overhead and profit for each cash allowance will be included in Contract Price.

.2 Overhead and profit for contingency allowance, as noted in Section 00 73 00, under Article 2.16.

.5 Contractor will provide the Owner with at least three (3) competitive prices for work of each allowance. The Owner shall determine actual costs as specified in Paragraph 8.

.6 Additional expenditures not identified as part of the allowances will be submitted for review by the Owner and where deemed applicable authorized in writing by the Owner.

.7 Notification in writing by the Owner is required prior to the Contractor executing work outlined under each allowance.

.8 The Owner will provide the Contractor with applicable documentation, equipment, and products within the time specified or, where such time is not specified, in sufficient time to permit the construction schedule to be maintained.

1.3 Contingency Allowance

.1 Include in Stipulated Sum, a contingency allowance of **$5,000** for project incidentals. Includes unforeseen work related to the Project.

1.4 Determination of Actual Costs

.1 Invoices, bills of sale, and notes payable for actual cost of items and services covered in an allowance amount shall be submitted by the Contractor for verification by the Owner.

.2 Trade discounts and refunds shall be credited to Owner.

.3 Where applicable, the valuation for a change shall be in accordance to Section 00 73 00 – Supplementary Conditions.

1.5 Adjustment of Contract Price

.1 When actual costs are determined for each allowance, the Contract Price will be valued accordingly by a Change Order.

END OF SECTION

1.0 GENERAL

1.1 Substitution of Materials Prior to Bid Closing

.1 Substitution of specified products or systems is permitted only when alternatives have been approved by the Consultant, in writing, prior to bid closing.

.2 Inform the Consultant in writing when specified products or systems are not anticipated to be available at the Place of the Work during construction. The Consultant will advise Bidders of alternatives.

.3 If specified products or systems are not available and the Consultant was not notified prior to bid submission, the Consultant will choose a suitable substitute product at the time of construction.

1.2 Request for Approval of Alternatives

.1 A Bidder or Supplier of a product or system may apply for approval of their product or system as an alternative up to five calendar days prior to bid closing. The Consultant will advise applicants of the status of their request prior to bid closing.

.2 Provide the Consultant with sufficient information to review the alternative. This information may include:

.1 Project name and number

.2 Specification sections affected by the proposed alternative

.3 Product technical data sheets

.4 Supplier installation instructions and requirements

.5 Supplier warranty and warranty requirements

.6 Product application sample at specified material thickness and finish on sample substrate

.7 Installation history, including:

.1 Installation locations, dates, project sizes, project values

.2 Description of project and product usage

.3 Owner and consultant

.8 Test data

1.3 Approval of Alternatives

.1 The Consultant reserves the right to reject any requests for approval of alternatives.

.2 The Consultant will outline approved alternatives by addenda issued prior to bid closing. The addenda will indicate the alternative Product or system, where and how it may be used, and limitations. If an addendum is not issued, the bid is to be based on use of the specified Product or system.

.3 The Contractor assumes full responsibility and bears all associated costs where an alternative Product or system is incorporated into the Work. Claims for increases to the Contract Price or for changes to the Date for Substantial Performance of the Work due to changes in the Work that are necessitated by the use of an alternative will not be considered. All associated costs are to be included in the bid.

.4 The Contractor is to reimburse the Owner for their additional costs associated with incorporating alternatives into the Work. This may include additional consulting costs billed to the Owner to accommodate changes to the Contract Documents necessitated by the change.

.5 Contractor cost savings arising from approval of alternatives are to be reflected in the Contract Price.

END OF SECTION

1.0 GENERAL

1.1 Project Coordination

.1 The Contractor is responsible for coordination of trades. Lines of demarcation between Contractor and trades or trade and trade are solely the responsibility of the Contractor.

.2 Contractor is responsible for coordination with the Owner for on-site activity as it affects the operation of the building.

1.2 Notification for Field Review

.1 Notify the Consultant at least 24 hours in advance for field review. No work shall be covered or concealed until reviewed by the Consultant unless informed that a field review will not be performed. Such review does not absolve the Contractor from their responsibility to perform the work in accordance with the Contract Documents.

.2 The Consultant shall notify the designated testing company for material sampling and testing.

.3 Provide the Consultant with safe access to any part of the Work requiring field review.

.4 The Owner may be present during field review at the Owner’s discretion.

1.3 Superintendence

.1 Provide a full time Superintendent who is to be on-site on a continuous basis during the execution of the work. Superintendent shall have a mobile phone at all times during working hours to allow for communication with the Consultant or Owner.

.2 Superintendent shall have facility with the English language both written and verbal.

.3 Superintendent shall be satisfactory to the Owner and the Consultant and shall not be changed without the Consultant or Owner’s consent.

.4 Superintendence shall be deemed unsatisfactory and changes or additions to superintendence may be demanded when control, organization, or coordination of the Work is not satisfactory, quality of the Work does not meet requirements of the Contract Documents, directions given in accordance with the Contract Documents are not followed, or progress is behind schedule.

END OF SECTION

1.0 GENERAL

1.1 Work Included

.1 Administration of Project Meetings

.2 Pre-Construction Meetings

.3 Progress Meetings

1.2 Administration of Project Meetings

.1 Consultant will preside at meetings.

.1 A representative of the Consultant will record the minutes, include significant proceedings and decisions, and identify "action by" parties.

.2 Consultant will reproduce and distribute copies of the minutes to meeting participants, affected parties not in attendance, the Owner, and the Contractor.

.2 Consultant will:

.1 Schedule and administer project meetings unless otherwise noted.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each unscheduled meeting three days in advance of meeting date to the Contractor and Owner. Contractor is to notify relevant Subcontractors.

.3 Contractor shall provide physical space and arrange for meetings on site.

.4 Representatives of Contractor, Subcontractors, and suppliers attending meetings shall be qualified and authorized to act on behalf of the party each represents.

1.3 Pre-Construction Meeting

.1 After award of Contract, a meeting of all parties in the Contract shall be held to discuss and resolve administrative procedures and responsibilities.

.2 Representatives of the Owner, Consultant, Contractor, major Subcontractors, and construction review personnel will attend.

.3 Consultant will establish a time and location of the meeting and notify concerned parties at least five days before the meeting.

.4 Agenda to include the following:

.1 Appointment of official representatives of participants of the Work.

.2 Schedule of Work, progress scheduling.

.3 Shop drawings (if required) and schedule of shop drawing submissions.

.4 Requirements of temporary facilities, site signage, hoarding, dust protection, offices, storage sheds, utilities, fences.

.5 Delivery schedule of critical equipment.

.6 Site security.

.7 Contemplated change orders, procedures, approvals required.

.8 Take over procedures, acceptance, warranties.

.9 Monthly progress claims, administrative procedures, holdbacks.

.10 Appointment of inspection and testing agencies or firms.

.11 Insurance, transcript of policies.

1.4 Progress Meetings

.1 During the course of Work, the Consultant or Contractor will schedule progress meetings every two weeks. Further progress meetings may be scheduled by the Consultant, Contractor, or Owner as required to expedite the Work.

.2 Consultant, Contractor, major Subcontractors involved in the Work, and Owner, when required, are to attend.

.3 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems that impede construction schedule, conflicts.

.4 Progress, schedule during succeeding work period.

.5 Corrective measures and procedures to regain projected schedule.

.6 Revisions to construction schedule.

.7 Review of off-site fabrication delivery schedules.

.8 Review submittal schedules; expedite as required.

.9 Maintenance of quality standards.

.10 Pending changes and substitutions, Notices of Proposed Change, Change Orders.

.11 Review proposed changes effect on construction schedule and on completion date.

.12 Other business.

END OF SECTION

1.0 GENERAL

.1 This Section specifies general requirements and procedures for shop drawing, product data, sample, and mock-up submissions for Consultant's review. Additional specific submission requirements may be specified in other Sections.

.2 Do not proceed with Work until relevant submissions are reviewed by Consultant.

.3 Present shop drawings, product data, samples, and mock-ups in SI metric units. Where items or information is not produced in SI metric, converted values are acceptable.

.4 Contractor's responsibility for errors or omissions in any submission is not relieved by Consultant's review of the submission.

.5 Notify Consultant, in writing at time of submission, of any deviations from the requirements of Contract Documents that form part of submissions. Also indicate the reasons for the deviations.

.6 Contractor's responsibility for deviations from the requirements of the Contract Documents in submissions is not relieved by Consultant's review of the submissions unless Consultant provides written acceptance of the identified deviations.

.7 Make any changes in submissions that Consultant may require consistent with the Contract Documents and resubmit where directed by Consultant.

.8 Notify Consultant in writing of any revision other than those requested by Consultant when resubmitting.

1.1 Submission Requirements

.1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.2 Submit electronic copies of product data, manufacturer's catalogue sheets, brochures, literature, performance charts, and diagrams.

.3 Comply with the following requirements in regard to submission of product data:

.1 Delete information not applicable to project.

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

.3 Provide certification of compliance to applicable codes.

.4 Provide manufacturer's certification as to current production.

.4 Allow 10 working days for Consultant's review of each submission.

.5 Accompany submissions with an electronic transmittal letter that contains:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each shop drawing, product data, and sample.

.5 Other pertinent data.

.6 Submission shall include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

.5 Details of appropriate portions of Work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

.6 After Consultant's review, distribute electronic copies to relevant affected subcontractors.

1.2 Shop Drawings

.1 Provide electronic copies of shop drawings pertaining to installations and fabrications required by the Contract for Consultant review prior to commencing work. Provide full-size hard copy submissions if requested by Consultant. Unless noted otherwise, submit shop drawings for the following:

.1 Chimney demolition procedure.

.2 Metal flashing for the existing roof.

.2 As part of RJC's field services, RJC will review shop drawings pertaining to work shown on RJC's drawings by means of an appropriate rational sampling procedure and will comment on the accuracy with which the Contractor prepared the shop drawings.

.3 Review of shop drawings is for the sole purpose of ascertaining conformance with the general design concept and is not an approval of the detail design inherent in the shop drawings. Design responsibility remains with the Contractor submitting the shop drawings.

.4 Review of shop drawings does not relieve Contractor of their responsibility for errors and omissions in shop drawings or for meeting all requirements of the Contract Documents.

.5 Contractor is solely responsible for information pertaining to fabrication process, techniques of construction and installation, and coordination of subcontractors.

.6 Cross-reference shop drawing information to applicable portions of Contract Documents.

.7 Shop drawings that require approval of any legally constituted authority having jurisdiction shall be provided by the Contractor to such authority for approval.

1.3 Product Data

.1 Product Data: Manufacturer's catalogue sheets, brochures, literature, performance charts, and diagrams, used to illustrate standard manufactured products.

.2 Submit electronic copies of product data.

.3 Sheet Size: 215 x 280 mm.

.4 Delete information not applicable to project.

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

.6 Cross-reference product data information to applicable portions of Contract Documents.

1.4 Samples

.1 Samples: Examples of materials, equipment, quality, finishes, workmanship.

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

.3 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be reviewed.

1.5 Mock-Ups

.1 Mock-Ups: Field-erected examples of work complete with specified materials and workmanship.

.2 Erect mock-ups at locations acceptable to Consultant.

.3 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be reviewed.

END OF SECTION

1.0 GENERAL

1.1 Temporary Utilities

.1 Provide and pay for where specified, locate where directed, and maintain temporary facilities for the Work and for all Subcontractors, and remove them upon completion of the Work.

.2 Where specified to provide utilities, make all arrangements with the public utilities, obtain all necessary permits, provide or pay for connections, and pay all respective fees.

1.2 Electrical Power

.1 Discuss available power with the Owner prior to bidding.

.2 The Contractor shall pay for any alternations to the electrical system that may be needed to accommodate the Contractor’s equipment. Coordinate any required alterations with the Owner’s Representative. Reinstate the system to its original condition upon completion of the Work.

.3 The Owner shall pay for electrical consumption from building sources made available by the Owner.

1.3 Water Supply

.1 Contractor shall pay for the cost of any temporary water connections or alterations that are required to perform the Work. Reinstate the system to its original condition upon completion of the Work.

.2 The Owner shall pay for water consumption from building sources made available by the Owner.

1.4 Temporary Lighting

.1 Provide and maintain temporary lighting for safe demolition and working conditions conforming to Ontario Occupational Health and Safety Act.

.2 Illumination must be provided and maintained on all floors and stairs affected by the Work.

.3 Contractor is to have an emergency generator and lighting system available to be used in a situation where the existing lighting system becomes inoperative due to the Work and cannot be repaired within a two (2) hour period. Once the repair is complete, the temporary lighting system may be removed.

.1 If the damaged lighting cannot be repaired within the specified period, the Contractor must promptly notify the Owner.

.2 If the Contractor does not repair the damaged lighting within the specified time and does not promptly notify the Owner, the Owner reserves the right to repair the damage and deduct the cost from the Contract.

.4 Temporary lighting requirements discussed herein shall also apply to all subcontractors.

1.5 Temporary Telephone

.1 Provide and pay for a mobile telephone for the Contractor’s own use and, as required, the use of Consultant and Owner.

1.6 Temporary Fire Protection

.1 Provide and maintain temporary fire protection equipment during performance of the Work as required by governing codes, regulations, and by-laws.

1.7 Temporary First Aid Facilities

.1 Provide well-stocked and maintained first aid kits within the site office that are adequate to meet the requirements and hazards of the Work.

.2 Maintain safety data sheets (SDS) for all material being used at the project site. Ensure the SDS are readily available to the Consultant, Owner, and Contractor’s forces.

1.8 Temporary Sanitary Facilities

.1 Provide temporary sanitary facilities at the time of initial mobilization and maintain them throughout the course of the work. An exception will be granted to this requirement only where Owner has confirmed in writing that on-site washrooms are available for Contractor use.

.1 Sanitary facility is to include an odourless flushing chemical type temporary toilet that is properly enclosed, weatherproof, and serviced periodically as required.

.2 The building toilets and facilities shall not be used by the Contractor's forces unless approved by Owner

1.9 Temporary Field Offices and Sheds

.1 Provide or construct work sheds for storage of tools, equipment, and materials that may be damaged by weather.

.2 Provide and maintain a field office for the Contractor's personnel that is equipped with lights, power, and tables for drawing examinations.

.3 Maintain sheds in a clean and orderly condition to the Consultant's satisfaction.

.4 Provide suitable hardware and locks on doors to sheds to reasonably secure them and keep locked when unsupervised.

.5 Field sheds shall be weather tight and have floors elevated above grade.

.6 Relocate sheds as required by the progress of the Work. Remove sheds from the Site when directed or when they are no longer required.

1.10 Temporary Barriers and Enclosures

.1 Provide hoarding, fencing, barriers, barricades, and plant protection as required by the authorities and specified herein to protect persons and property, public and private. Refer to Section 01 56 00 for signage and hoarding requirements.

.2 Maintain barriers in sound, clean, and where required painted condition throughout the Work.

.3 Keep site clear of unauthorized signs.

.4 Provide barriers with required warning lights and signs.

.5 Hoarding, fencing, barriers, and barricades are to be constructed and supported in such a manner that no sharp projections that can cause personnel injury are created.

.6 Remove hazards requiring barriers as soon as possible.

.7 Remove barriers at time of turn-over of the Work to the Owner.

.8 Exterior enclosures shall be constructed to protect the work area from environmental conditions (i.e. weather tight) that may affect schedule.

1.11 Temporary Heating and Ventilation

.1 Provide and maintain supplementary heating as required to maintain sufficient application and curing temperatures.

.2 Provide and maintain supplementary ventilation as required. Ventilation requirements shall conform to Occupational Health and Safety Standards. Do not modify the base building systems without the coordination and approval of the Owner.

.3 Temporary heating and ventilation used during construction -- including the cost of installation, fuel, operation, maintenance, and removal of equipment -- shall be paid for by the Contractor. The use of direct-fired heaters discharging waste products into enclosed work areas will not be permitted.

1.12 Security

.1 Take all necessary precautions to guard site, premises, materials, and the public at all times other than when supervised work is in progress.

1.13 Protection of Work During Close-Down

.1 Should the project be closed down for any cause, assume all responsibility for its proper protection during such period.

END OF SECTION

1.0 GENERAL

1.1 Work Included

.1 Protection of the Work, work in progress, property, and persons by all Sections.

1.2 Walk-Through Inspection of Site

.1 Prior to start of Work, Contractor, Consultant, and Owner will perform walk-through inspection of site and inspection of elevators to determine existing conditions. Owner to pay for elevator service personnel during inspection.

.2 The Contractor is to perform a thorough inspection of the site prior to the start of work and provide a written notice to the Consultant that details all damaged property, as well as all items that appear to be of poor working order or appearance (i.e. sign, fixtures, dirt, etc.)

.3 Upon receiving this notice, the Consultant and Owner will review the validity of the items listed.

.4 If written notice is not given within five days of commencement of Work, it will be assumed that the Contractor has reviewed the site and has accepted the condition of the property as being free of damage.

.5 Any damages not listed as part of the written notice of clause 1.2.2 above found after the completion of the work will be the sole responsibility of the Contractor to rectify. These rectifications shall be completed in a timely and satisfactory manner.

.6 The project will not be considered substantially performed if the cost to correct these outstanding deficiencies is greater than the limits outlined in the Construction Lien Act.

1.3 The Work, Work In Progress, Property, and Persons

.1 Protect the Work during construction from damage by weather.

.2 Provide protection as required to protect work in progress and other property from damage and to provide suitable conditions for the progress of finishing work.

.3 Provide means for protecting occupied areas below the Work from water leakage between removal and reinstallation of the waterproof membrane.

.4 Take reasonable and required measures, including those required by authorities having jurisdiction, to protect the public and those employed on the Work from bodily harm.

.5 Comply with requirements of Ontario Occupational Health and Safety Act for construction projects.

.6 Contractor shall be prepared to provide respirators, dust protection, ear protection for those employed by the Consultant and Owner at the site.

.7 Direct all Subcontractors to protect their own work, existing property, adjacent public and private property, and work of other Sections from damage while working.

1.4 Construction Signage

.1 Contractor shall provide all required signage necessary to protect the public from the construction, control the traffic flow through the work areas and to inform patrons that construction activity is in process.

.2 Additional signs may be required at the discretion of Owner or Consultant as construction progresses. No extras will be entertained for signage requirements after tenders close.

.3 All signage required are to be as per Owl-Lite Rentals, Sales and Manufacturing Product Catalogue (quality, design, size, etc.). This catalogue is available for viewing in the office of the Consultant, or copies can be obtained from Owl-Lite (tel: 416-647-9663). “Standard Construction Signs” (i.e. orange background with 150 mm high black letters or decals). All signage to be of professional quality and design.

.4 Typical signage that may be required are as follows:

.1 Keep Out: Work in Progress

.2 Caution: Work Overhead

.5 Signage will be required at all access gates and entrances to the work area. This signage shall consist of the standard “Danger Do Not Enter” sign with an additional signs (special order) indicating that the area is temporarily under construction and we are sorry for the inconvenience.

.6 Signage is required at all stairwell entrances to the work area. Signs to indicate that this entrance to garage is temporarily closed for construction.

.7 All non-standard signage is to be of adequate size (discuss with Consultant prior to ordering) with orange background and large black letters and decals. Plywood backing is sufficient. All signs are to be of professional quality.

.8 All signage is to be securely fastened directly to hoarding or, if signage is required and hoarding is not available, the signs are to be securely fastened to two screw jack (post shores) which are fully tightened to the slab soffit and slab surface. Signs and posts are to be installed in such a manner that projections that may cause public injury are not created.

1.5 Construction Barriers and Enclosures

.1 All work areas are to be completely enclosed by hoarding and dust protection and only accessible to the Contractor, Owner, and Consultant.

.2 Contractor shall supply and construct hoarding, barriers, and enclosures as indicated in these specifications, drawings, and as directed by the Consultant or Owner as the construction progresses.

.3 No extras shall be entertained for hoarding, barriers, and enclosures after bid close unless the scope of work is significantly changed.

.4 Work areas are to be completely enclosed to keep dust generated by construction activity from escaping into other areas of site or interior areas.

.5 Contractor shall be responsible to ventilate work area as required (fresh air in and exhaust out) without allowing any dust to escape from the work area. Exhaust system must filter dust out of the air before it is released into the atmosphere. All exhaust systems must be filtered and directed to exhaust vents or outside of the building through ducting, which is to be suspended from the slab soffit. Filters are to be cleaned and replaced regularly, and as directed by Consultant.

.6 The Contractor is responsible for any damage to mechanical equipment, motors, elevator equipment, fire alarm system/devices, etc. resulting from dust contamination.

.7 Areas that are to be protected but still require access, such as elevator lobbies and stairs, will be hoarded using temporary vestibules. Pressurization to be adjusted by Contractor by providing necessary fans to prevent dust from entering these areas.

.8 The following types of enclosures/ hoarding systems will be required for this construction project:

.1 Type 1 - Fast Fencing

.1 This system consists of 6’-0” high fast fencing (properly secured to the ground) enclosing the work area. Signs are to be installed as required and as shown on the Phasing Drawings. Poly-weave mesh shall be securely fastened to the fencing (full height) to limit dust from exiting the work area. At the acceptance of the Owner, the poly-weave mesh may be removed.

.2 Type 2 – Protection for Interior Spaces

.1 This system will be designed by the contractor to prevent any leakage into the building between the removal of the chimney and the installation of the new roofing system.

.9 Exterior side of hoarding is to be painted white. The Contractor shall be responsible to maintain the condition of hoarding and for additional painting of hoarding required to cover graffiti.

.10 Anchor holes are to be repaired after construction hoarding has been removed. Contractor to repair all finishes and painted surfaces damaged by fastening materials used as part of hoarding and protection systems.

.11 Restrict access for unauthorized personnel by placing barricades or posting guards around areas of the Work. Unauthorized personnel shall mean the public and anyone not directly concerned with the execution, supervision, or inspection.

.12 Exterior locations (areas exposed to weather) are to be protected against weather conditions that may hinder the performance of work in these areas.

1.6 Existing Buildings, Curbs, Roads, Lanes, and Landscaping

.1 Protect existing buildings, structures, curbs, roads, lanes, and hard and soft landscaping. If, during work, any existing items are damaged, repair or replace them.

.2 Provide pavement, curb, and sidewalk protection for public thoroughfares and the Work in progress as required by the authorities, and to protect public property and the Work.

.3 The Contractor shall remove and re-install all steel bollards anchored to slab surface in areas where repairs are to be performed. Re-install bollards after installation of waterproofing.

1.7 Control of Construction Generated Dust, Debris, Fumes, Etc.

.1 Dust, dirt, construction debris, water, and fumes from the work areas must not be permitted to enter areas of the building or rooms in or adjacent to work areas.

.2 Protection shall be provided for all entrance and exit ways, floors, walls, standing fixtures, air intakes, exhaust fan openings, floor drains, elevators, and equipment rooms against dust, spillage, overspray of materials, and damage during the construction period. The required protection shall consist of but not be limited to the following:

.1 Filter cloth in all area drains within the work area.

.2 Filter cloth over all intake and exhaust louvers and openings.

.3 Poly-weave tarping over doorways and around the exterior perimeter of work area to prevent the escape of dust and debris from the work area.

.4 Protect sprinkler heads with polyethylene or filter cloth to prevent dust build up.

.3 Provide for protection of vehicles in or near parking structure and payment for cleaning or damage to vehicles.

1.8 Protection of Existing Exposed Facilities

.1 Protect existing lighting system from damage or remove and re-install upon completion of repairs.

.2 If Contractor wishes to use existing lighting system as an alternate to installing temporary light, Contractor shall assume all responsibility for damages incurred.

.3 Protect exposed conduit, fixtures, attached devices, sprinkler fire system plumbing, mechanical system components, louvres, and ducts against the accumulation of dust, debris, and damage. The Contractor will be responsible to correct any damages to these systems at their own expense. Contractor to promptly report any damage to the Owner and the Consultant.

.4 Protect existing parking garage control equipment, overhead doors, etc. from damage.

.5 Inspect materials, equipment, and components to be re-used or turned over to the Owner. Note their condition and advise Consultant in writing of any defects or conditions that would affect their removal and re-use, prior to removal.

.6 Prior to commencing Work, contact the Owner to locate all protective or alarm systems and sensors. All services shall be protected against damage or interruption. All claims resulting from damage shall be the responsibility of the Contractor.

.7 Contractor must notify the Owner of any fault or alarm to the main fire alarm panel immediately. When Contractor's activities result in charges to service the fire alarm panel or alarm system, the Contractor shall bear all costs.

.8 Any damage to existing surfaces or finishes to remain caused by the construction shall be repaired by the Contractor at no cost to the Owner.

1.9 Fire Protection

.1 Take necessary precautions to eliminate fire hazards and to prevent damage to the Work, building materials, equipment, and other property, both public and private, having to do with the Work. Inspect the Work at least once a week for this purpose.

.2 Store and locate products and equipment packed in cardboard cartons, wood crates, and other combustible containers in orderly and accessible manner. Place approved types of firefighting equipment in vicinity of products packed in this type of crate or carton until permanent fire protection and equipment are available.

.3 Do not store flammable products, such as paint or fuel, on site except in Owner-approved locations, if available.

.4 Tarpaulins to be fire-resistant.

.5 Open fires and burning of rubbish or debris are not permitted on site.

1.10 Overhead Protection

.1 The Contractor shall erect and maintain pedestrian walkway including roof and side covers, complete with electrical lighting, to protect the public and property from injury or damage.

.2 Minimum extent of overhead protection as designated on drawings.

.3 Minimum unobstructed overhead height of 2.4 m. Minimum unobstructed width of at least 2 m greater than the combined width of access doors and side lights at entrances. Minimum length shall provide protection for a clear distance of 10 m horizontally from the nearest swing stage.

.4 Overhead protection shall be capable of supporting any load likely to be applied to it, and capable of supporting a load of at least 2.4 kN/m^2.

.5 Install and provide adequate temporary lighting within the entire length of the overhead protection. Type, quantity, and attachment of light fixtures to be approved by Owner.

.6 Apply plywood panels to sides, vertically flush and butt-jointed. Paint sides of plywood enclosures in colour(s) selected by Owner, with one coat primer to CGSB 1-GP-59M and one coat exterior paint to CGSB 1-59M + Amdt-Aug-84.

.7 All overhead protection and enclosures to be marked with safety signage.

.8 All overhead enclosures and protection to be maintained daily, keeping them clean, orderly, and graffiti free.

.9 Remove temporary facilities from site promptly when directed by Owner.

END OF SECTION

1.0 GENERAL

1.1 Manufacturer's Instructions

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods. Supply copies of these instructions to Consultant prior to commencing work.

.2 Notify Consultant in writing of any conflict between the Contract Documents and manufacturer's instructions.

1.2 Delivery, Storage, and Handling

.1 Deliver, store, and maintain packaged materials with manufacturer's seals and labels intact.

.2 Immediately remove rejected materials from the Place of the Work.

.3 Storage and handling of materials shall conform to Ontario Occupational Health and Safety Act and manufacturer's instructions.

.4 Toxic or hazardous materials shall be secured in a locked storage area.

.5 All containers to be labeled in accordance with WHMIS regulations.

.6 All containers to be labeled with material expiration dates. Materials older than the expiry date shall not be used on the Work and shall be removed immediately from the site.

.7 Provide Owner and Consultant with electronic copies of all Safety Data Sheets (SDS) and maintain hard copies on site.

1.3 Materials

.1 Use new products unless otherwise specified.

.2 Provide electronic copies of maintenance instructions and material literature for finished surfaces prior to Substantial Performance.

END OF SECTION

1.0 GENERAL

1.1 Description of Work Included

.1 Provide all labour, material, equipment, and services necessary to clean the area of the Work, including all surfaces, fixtures, equipment, finishes, landscaping, etc., and dispose of all waste products and debris in the work area as indicated in the Contract Documents.

.2 Provide all labour, material, equipment, and services necessary to clean outside the area of the work if dust, debris, and waste products generated by the Work have affected these areas.

1.2 General Requirements

.1 Conduct cleaning and disposal operations in compliance with local, provincial, and federal regulations and laws, as well as Owner requirements.

.2 Prevent the accumulation of waste that creates hazardous conditions.

.3 Provide adequate ventilation during use of volatile or noxious substances. Obtain approval for ventilation exhaust locations with the Owner prior to installation.

.4 Coordinate requirements for ventilation and waste disposal operations with the Owner and Consultant.

1.3 References

.1 Waste Control Regulation - Ontario Environmental Protection Act

1.4 Materials and Equipment

.1 Use only cleaning materials and equipment that are approved by the manufacturer of the surface to be cleaned and use the cleaning materials in conformance with manufacturer recommendations.

1.5 Prior to Construction

.1 The Contractor shall examine the Place of the Work prior to mobilization to determine conditions with respect to dust, debris, rubbish, and waste material.

.2 It is the Contractor's responsibility to clean Work areas and all areas affected by the Work free of all debris generated by the construction activity and existing dust, debris, rubbish, and waste material present at the start of Work, unless explicitly otherwise indicated in the Contract Documents or there are significant variations in conditions in comparison to the time of Bid.

.3 Onus is on the Contractor to satisfactorily demonstrate to the Consultant if conditions vary significantly from the time of bid. Significant variations will be resolved by the Owner.

.4 No extras will be entertained for site cleaning after Contract award.

1.6 Waste Removal and Cleaning During Construction

.1 Contractor to perform all required cleaning during the Work.

.2 Maintain the Place of the Work and areas affected by the Work free from accumulations of dust, debris, rubbish, and waste materials generated by the Work.

.3 Provide sufficient on-site containers for collection and disposal of dust, debris, rubbish, and waste material.

.4 Store volatile waste in covered containers. All waste that is volatile or creates a hazardous condition must be removed from the premises daily.

.5 Disposal is to be performed in strict accordance with the product Safety Data Sheet (SDS) and local, provincial, and federal regulation.

.6 Enclose work areas and prevent dust and debris generated by construction from affecting other areas, including areas required for construction access. Any dust and debris that escapes from the Work area is to be cleaned in a timely fashion and, at latest, prior to the end of the work day/ shift.

.7 If the Consultant deems that cleaning has not been performed in a timely fashion, the Owner may seek to resolve the conditions in accordance with the Contract General Conditions.

.8 Flush and clean the drainage system, including buried or hidden drain lines, all the way to sump pits and catch basins to maintain operation of the drainage system throughout the Work.

.9 Cover drains affected by or required for the Work with filter fabric to prevent debris from entering the drainage system.

.10 Do not dispose of project waste and material in the drainage system.

1.7 Drainage System – Cleanliness and Damage

.1 Flush clean all the drainage systems – including catch basins, maintenance holes, drains, sump pits, weeping tile, piping, etc. – within the area of Work. Remove and dispose of silt and debris by manual or suction means without washing it down or through the drainage system.

.2 Maintain the drainage systems in this cleaned state throughout the Work.

.3 Confirm the operation and condition of the sump pits prior to performing work that affects or requires their operation. The existing pumps may be used during construction but the Contractor is responsible to maintain their operation.

.4 Provide additional pumps if existing pumps cannot effectively remove water generated by construction.

.5 Do not discharge water from construction directly into any of the site sewer or storm water management systems. The water is to be treated with proper filtering, stilling basins, and tankage to prevent silt and debris from entering the systems.

.6 All equipment maintenance and refuelling operations shall be controlled to prevent the discharge of petroleum products into the sewer system.

.7 Damage caused to the existing water supply systems, storm water management systems, sewer systems, and surrounding areas by the Contractor’s operations are to be made good to the full satisfaction of the Owner at Contractor cost.

.8 A cleaning contractor specializing in flushing and cleaning drainage systems shall clean and flush the sewer systems after completion of dust and water generating parts of the Work.

1.8 Final Cleaning

.1 Thoroughly clean all areas affected by the Work free of all dust, debris, construction material, waste, and rubbish immediately prior to final review and turn-over of the Work area to the Owner.

.2 Remove all grease, dust, dirt, stains, labels, fingerprints, over-spray, and other foreign materials immediately prior to final review and turn-over of the Work area to the Owner.

.3 Flush and clean free of all silt and debris and provide CCTV inspection of all drainage lines for the Consultant to review to demonstrate the condition of the drainage lines and effectiveness of the cleaning.

.4 Prior to Substantial Performance of the Work being considered, the Contractor shall remove their surplus products, tools, and Construction Equipment not required for the performance of the remaining Work. Leave the area of Work clean and suitable for occupancy.

.5 The Contractor shall remove their remaining products, tools, and Construction Equipment prior to final completion of the Work.

.6 All vertical and horizontal surfaces, systems, fixtures, equipment, etc. shall be cleaned of all dust, grease, or spray accumulations. Power wash exterior surfaces and parking areas affected by the Work. Ensure moisture sensitive equipment (i.e. fire detection sensors and pull stations, CO detectors, exposed electrical, etc.) is removed or protected against moisture ingress and damage prior to, and during, washing.

.7 Return all interior areas and rooms to the Owner in a dust-free condition.

.8 Sprinkler system components, where present, that have been coated with paint, cement paste, or other foreign materials shall be replaced at no additional cost to the Owner.

END OF SECTION

1.0 GENERAL

1.1 Take Over Procedure

.1 Contractor's Review

.1 The Contractor and their Subcontractors shall conduct a review of the work and correct all noted deficiencies.

.2 The Contractor shall notify the Consultant, in writing, of satisfactory completion of the "Contractor's Review" after the correction of all noted deficiencies and shall request a "Consultant's Review".

.2 Consultant's Review

.1 The review team shall consist of the Consultant and the Contractor. The Owner or their representative shall attend at their option.

.2 The Consultant will prepare a list of deficiencies noted during the "Consultant's Review" and will issue the list to the Contractor.

.3 The Consultant will determine the value of work associated with any outstanding deficiencies noted during the Consultant's Review. Payment of these retained funds will be withheld until the deficiencies have been rectified to the satisfaction of the Consultant and Owner.

.4 The Contractor shall correct all deficiencies indicated on the list in a timely and satisfactory manner.

.3 Final Review

.1 The Contractor shall request a "Final Review" when the Contractor is satisfied that all deficiencies have been corrected. The request shall be made in writing.

.2 The "Final Review" shall be conducted by the Consultant and the Contractor. The Owner or their representative will attend at their discretion.

.4 Certificate of **Substantial Performance**

.1 The Contractor must submit a request in writing to the Consultant for a Certificate of Substantial Performance.

.2 The Contractor shall comply with the following during Contract close-out:

.1 The requirements of the Construction Lien Act.

.2 The requirements of the Workers Compensation Act.

.3 All other contractual requirements.

.5 Total Performance

.1 Immediately following the issuance of the Certificate of **Substantial Performance**, the Consultant, in consultation with the Contractor, will establish a reasonable date for the “Total Performance of the Work”.

.2 The Contractor shall supply all guaranties and review certificates in accordance with the requirements of the Contract Documents prior to the date established for “Total Performance of the Work”.

.6 Release of Holdback

.1 The lien holdback amounts will be released pursuant to the Construction Lien Act.

END OF SECTION

1.0 GENERAL

1.1 Warranty / Guaranty Period

.1 Provide a three-year minimum warranty for all Work of Contract commencing on date of Ready-for-Takeover and ending three years thereafter.

.2 Extended and/or product warranties beyond the minimum period are outlined below.

1.2 Roofing Membrane Warranty

.1 Total warranty period of ten (10) years.

1.3 Remedial Work Under Guaranty/Warranty

.1 Perform any warranty repair work required during the warranty period at no extra cost. Refer to 1.3.3 for additional information on costs.

.2 Owner will notify Contractor within 30 days of discovery of any suspected warrantable defect in the Work. Immediately take necessary steps to protect area against further damage and take corrective action to bring defect into conformance with Contract Documents and rectify any damage incurred. Schedule repair work with Owner and make every attempt to correct defects within three weeks of notice.

.3 In event of a valid warranty claim resulting in corrective work, Contractor and Owner shall contact Consultant to determine what level of involvement, including but not limited to field review, may be necessary. Should Consultant determine that field reviews are required during warranty repair work, Contractor shall be responsible for Consultant fees.

.4 Remedy is at no cost to Owner and includes all labour, material, equipment, supervision, and field review necessary to correct defective areas of the Work and any damages incurred to obtain access to defective areas.

.5 Reimburse Owner for resulting assessment costs, including fees associated with Consultant involvement, incurred to define extent of defect and for testing costs incurred to confirm acceptability of repairs.

.6 Reimburse Owner for associated costs incurred due to closure of areas requiring repair under warranty.

.7 Warranty periods for areas requiring repair are to be extended by amount of time elapsed between issuance of notice and completion of remedial work. Warranty/ guaranty period will re-commence upon completion of remedial work.

.8 Warranties are not to be deemed to restrict liability of Contractor arising out of applicable law.

END OF SECTION

1.0 GENERAL

1.1 Record Drawings

.1 Consultant will provide Contractor two sets of clean white prints for project record drawing purposes.

.2 The Contractor shall maintain accurate project record drawings on one set of white prints throughout the course of the Work that indicate deviations from the Contract Documents in red ink.

.3 Record following information:

.1 Field changes of dimensions and details.

.2 Modifications made via Change Order, Change Directive, or Supplemental Instruction.

.3 Deviation from electrical and mechanical installations shown on Drawings.

.4 Other significant deviations that are concealed in construction and cannot be identified by visual inspection.

.5 Type, approximate size, and location of structural repairs, delaminations, etc.

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

.4 At completion of the Work and prior to final review, neatly transfer “project records” records to the second set of white prints using a fine red marker. Neatly print lettering and numbers to match original size. Lines shall be neat and accurate.

.5 Add “PROJECT RECORD” at each drawing title block.

.6 Contractor shall submit both sets of project record record drawings to the Consultant prior to submission of the final progress payment application.

.7 Project record drawings shall be available for reference purposes and review by the Consultant at all times. Provide reproducible prints to the Consultant or Owner upon request.

.8 If the Project is completed without significant deviations from the Contract Documents, a written declaration may be submitted to the Consultant in lieu of project record drawings.

1.2 Operation and Maintenance Manuals

.1 Submit electronic copies of manufacturers' printed operation and maintenance manuals where outlined in the technical specifications.

.2 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance as requested within the related Specification sections.

END OF SECTION

1.0 GENERAL

1.1 Work Included

.1 Installation of hoarding/dust protection and shoring around the Work as indicated on phasing drawings in accordance with Section 01 56 00.

.2 Provide all labour, material, equipment, and supervision required to remove and dispose of all material and debris resulting from the removal of the following:

.1 The existing chimney portion extending over the roof deck surface within the area of work as directed by the Consultant

.2 Deteriorated, delaminated and sound concrete from the existing wall behind the existing chimney.

.3 All other material waste resulting from the performance of the work.

.3 Cutting and remedial work required to make the affected parts of the Work come together properly.

2.0 PRODUCTS

Not applicable.

3.0 EXECUTION

3.1 Inspection

.1 Visit and examine the site and note all characteristics and features affecting the Work of this Section.

.2 Properly identify all services, whether buried, built-in, or exposed, as to position, type of service, size, and direction of flow.

.3 Inspect materials, equipment, and components to be re-used or turned over to the Owner. Note their condition and advise the Consultant in writing of any defects or conditions that would affect their removal and re-use.

3.2 Preparation

.1 Prevent movement, settlement, or damage of elements of existing building that are to remain. Provide bracing, shoring, and supports as required. Protect existing surfaces not to be restored from damage during removal procedures.

.2 Cut and/or cap existing services within the work area, if any, prior to start of Work as required, but do not affect services of areas not under construction or essential to on-going operation of the building.

.3 In all cases, exercise reasonable care during removal operations to avoid damaging items to be salvaged, re-used, or items that are not part of the Work.

.4 Seal off work areas to prevent dust and debris from affecting other areas outside of work area. Prevent public access to areas being repaired.

.5 Cover drains as required to prevent any construction-related materials and debris from entering the drains. Ensure that all drains continue to operate as required during construction.

.6 Remove or protect in place all surface-mounted or permanent fixtures not to be demolished from damage during demolition procedure.

.7 Provide proposed demolition sequence for Consultant review prior to commencing work.

3.3 Demolition

.1 Remove and dispose of material and debris resulting from removal of the chimney portion extending over the roof deck surface within the area of work as directed by the Consultant.

.2 Demolition procedures and equipment shall meet all applicable noise control by-laws and regulations at the Place of the Work.

.3 Take care not to damage the surface of sound material that is to remain through removal operation. Where any such damage is done, it is to be repaired by Contractor at their own expense to Consultant’s approval.

.4 Where new concrete is to be applied to existing concrete, leave surface clean and sound.

.5 All required re-painting due to damage overspray, etc. is Contractor’s responsibility.

.6 At end of each day's work, leave work in safe condition so that no part is in danger of causing injury or damage.

3.4 Cutting and Remedial Work

.1 Perform cutting and remedial work required to make affected parts of the Work come together properly and complete the Work.

.2 Coordinate and perform the Work so that cutting and remedial work is kept to a minimum.

.3 Perform cutting by methods to avoid damage to other work.

.4 Provide proper surfaces to receive patching, remedial work, and finishing.

.5 Cutting and remedial work shall be performed by competent and qualified specialists familiar with the Products affected and in a manner that neither damages nor endangers the Work.

.6 Ensure that cutting and remedial work does not jeopardize manufacturers' warranties.

3.5 Waste Disposal

.1 Dispose of waste products and material in strict accordance with product manufacturer's material safety data sheets and governing waste control regulations.

.2 Existing drainage system is not to be used to dispose of project wastes and/or materials.

.3 Store volatile wastes or material in covered metal containers. Remove wastes that create hazardous conditions from premises daily.

END OF SECTION

GENERAL

1.1 Work Included

.1 Provide all labour, material, equipment, and supervision necessary to prepare wall repair areas and place new concrete repair material.

.2 Use of pre-packaged materials is to be in targeted repair locations as directed by the Consultant. These locations may include drive aisles requiring fast turnaround, locations requiring expedited application of traffic deck coating following concrete repairs, or smaller localized concrete repair areas.

.3 All repairs to painted surfaces are to be cleaned and repainted after the concrete repairs have been completed and sufficient time for concrete curing has elapsed.

1.2 Repair Quantity Determination

.1 Length and width shall be measured to the nearest 25 mm (1”).

1.3 References

.1 All referenced Standards are latest editions referenced by the Building Code in the Place of the Work, or latest editions if not referenced by Code.

.2 2024 Ontario Building Code

.3	CSA A23.1/CSA A23.2	Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete
.4	CSA A3000	Cementitious Materials Compendium
.5	CSA S413	Parking Structures
.6	ASTM C260/C260M	Standard Specification for Air-Entraining Admixtures for Concrete
.7	ICRI 310.2R	Selecting and Specifying Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair

1.4 Performance Requirements

.1 Repaired concrete surfaces shall not scale or crack excessively.

.2 Concrete repair materials shall not spall or debond from existing concrete.

.3 Concrete repair materials shall achieve a minimum compressive strength of 20 MPa within 24 hours.

1.5 Submittals

.1 Submit manufacturer's product specifications and data sheets for the following products:

.1 Cement slurry bonding agent

.2 Rapid cure delamination repair concrete material

.3 Top surface patch material

.4 Vertical/Overhead patch materials

.5 Curing compounds

.2 Submittals to be provided for review by the Consultant a minimum of two weeks prior to placement or use of products.

.3 Do not commence placement of repair products until review is complete and proposed products and procedures are accepted by Consultant.

.4 If requested by Consultant, provide a certificate signed by the Contractor and pre-packaged material manufacturer certifying the following:

.1 Surfaces to receive pre-packaged material were acceptable and satisfactory to receive the materials per the manufacturer’s requirements and these Specifications. Application of pre-packaged materials shall imply acceptance of surfaces.

.2 Pre-packaged materials were installed in accordance with manufacturer’s written instructions and these Specifications.

1.6 Qualifications

.1 Use only qualified concrete placers and finishers, with a minimum of two years’ experience in similar work.

2.0 PRODUCTS

2.1 Materials

.1 Portland Cement: Type GU to CSA A3000.

.2 Aggregate: Natural stone to CSA A23.1.

.3 Water: Potable and to CSA A23.1.

.4 Air Entraining Agents: To ASTM C260/C260M.

.5 Chemicals Admixtures: To CSA A3000. Calcium chloride is not permitted.

.6 Pozzolanic Mineral Admixtures: To CSA A3000.

.7 Curing Materials: To CSA A23.1.

.8 Blended Hydraulic Cementing Material: Type 10SF to CSA A3000.

.9 Supplementary Cementing Material: To CSA A3000.

.10 Superplasticizing Admixture: To CSA A3000.

2.2 Bonding Agent

.1 Contractor to provide manufacturer's recommended bonding agent, if applicable, prior to placement of repair material.

2.3 Surface Delamination Repair Materials

.1 Proportion patch materials with specially graded aggregate to give the following properties in accordance with CSA A23.2:

	Description	Requirements
.1	Compressive Strength (24 hours)	20 MPa minimum
.2	Compressive Strength (7 days)	30 MPa minimum
.3	Flexural Strength (7 days)	5 MPa minimum
.4	Slant/Shear Bond Strength (7 days)	5 MPa minimum
.5	Linear Shrinkage	0.08% maximum
.6	Rapid Chloride Permeability	less than 1,000 coulombs
.7	Thermally compatible with concrete substrate under all applicable service conditions.	

.2 The patch materials listed below may conform to the specified properties and linear shrinkage requirements. Manufacturer's latest product data sheets for proposed patch materials shall demonstrate that the patch material conforms to the specified requirements. Where product data is incomplete, manufacturer is to provide supplementary independent test data that demonstrates conformance.

.3 Patch Materials:

	Product Name	Manufacturer
.1	SikaEmaco-1060 (formerly MEmaco T 1060)	Sika
.2	SikaEmaco-1061 (formerly MEmaco T 1061)	Sika
.3	SikaEmaco S 466 (formerly MEmaco S 466)	Sika
.4	SikaEmaco 440 (formerly MEmaco S 440)	Sika
.5	Blue-Line Rapid Repair Grout	Con-Spec
.6	CPD Rapidcrete	CPD
.7	Eucocrete	Euclid Chemical
.8	Versaspeed 100	Euclid Chemical
.9	HP-S6 UG	King a Sika Company
.10	MS-S6 SCC	King a Sika Company
.11	MS-S10	King a Sika Company
.12	RS-S10	King a Sika Company
.13	Planitop 18	Mapei
.14	SikaTop 111 Plus w/Sikacem Accelerator	Sika
.15	SikaQuick 1000	Sika
.16	Sikacrete 08 SCC	Sika
.17	Structuroc H	Lafarge
.18	Traffic Patch Coarse	Target
.19	Traffic Patch Fine	Target

2.4 Vertical/ Overhead Delamination Repair Materials

.1 Overhead patch materials shall be polymer-modified, cementitious, fast setting, and formulated especially for the repair of overhead and vertical concrete surfaces.

.2 Patch materials to have the following properties:

	Description	Requirements
.1	Compressive Strength (7 days)	30 MPa minimum
.2	Flexural Strength (7 days)	5 MPa minimum
.3	Slant/Shear Bond Strength (7 days)	5 MPa minimum
.4	Linear Shrinkage	0.10% maximum
.5	Rapid Chloride Permeability	less than 1,000 coulombs
.6	Thermally compatible with concrete substrate under all applicable service conditions.	

.3 The patch materials listed below may conform to the specified properties and linear shrinkage requirements. Manufacturer's latest product data sheets for proposed patch materials shall demonstrate that the patch material conforms to the specified requirements. Where product data is incomplete, manufacturer is to provide supplementary independent test data that demonstrates conformance.

.4 Patch Materials:

	Product Name	Manufacturer
.1	SikaEmaco 440 (formerly MEmaco S 440)	Sika
.2	SikaEmaco S 466 (formerly MEmaco S 466)	Sika
.3	SikaEmaco 488CI	Sika
.4	SikaEmaco 425 Gel Patch (formerly MEmaco N 425)	Sika
.5	MS-S6 SCC Concrete	King a Sika Company
.6	MS-S6 Self-Consolidating Concrete	King a Sika Company
.7	MS-S10 Self-Consolidating Concrete	King a Sika Company
.8	Fibre Patch OV	Gemite Group
.9	Planitop X	Mapei

	Product Name	Manufacturer
.10	Planitop 23	Mapei
.11	Sika Top 122 PLUS (vertical only)	Sika
.12	Sika Top 123 PLUS	Sika
.13	Structuroc V	Lafarge

2.5 Admixtures

.1 Use only compatible admixtures and add to mix in strict accordance with manufacturer's written instructions.

.2 Use of calcium chloride not permitted.

3.0 EXECUTION

3.1 Concrete Surface Preparation

.1 All concrete surfaces to receive new concrete repair material shall have a minimum No. 6 CSP per ICRI 310.2R and be thoroughly abrasive-blast prior to concrete placement to remove laitance, debris, and loose aggregate.

.2 Clean all existing concrete surfaces to receive new concrete of foreign material, dust, debris, grease, and oil as directed by Consultant. Emulsifiers shall be required for surfaces containing grease or oil.

.3 Contractor to notify Consultant to review surfaces prior to concrete placement.

3.2 Concrete Placement – Surface Repairs

.1 Prepare patch surface, mix patch material, and apply, finish, and cure in strict accordance with the more stringent requirements of the Contract Specifications and manufacturer’s written instructions.

.2 The patch area shall be thoroughly wetted as required to achieve a saturated surface dry (SSD) state prior to placing concrete repair material.

.3 Puddles of free water shall be blown from the patch area and the surface is to be permitted to dry to a saturated surface dry (SSD) state prior to application of cement slurry.

.4 If required by manufacturer, apply a bonding agent to the surface of the concrete just prior to placing new concrete. The bonding agent shall be scrubbed into the concrete to fully saturate the surface but not allowed to puddle.

.5 Pre-wet filter fabric, burlap, or cotton mats shall be available on site prior to placement of concrete to allow for immediate placement overtop of new concrete patches after their initial set.

.6 Prepare pre-packaged concrete mix per manufacturer’s specifications.

.7 Contractor to confirm the minimum and maximum application lift thickness prior to placement of concrete. If required and permitted by the manufacturer, the concrete repair material can be extended with aggregate.

.8 Contractor to submit proposed aggregate extension mix design to the Consultant prior to proceeding with Work.

.9 Concrete surfaces to be flush with existing surfaces, free of voids and cracks, and have a uniform surface and transition to the existing surface.

.10 Finish concrete in accordance with CSA A23.1/A23.2. Initial finish shall be completed before any bleeding or free water is present on the surface of the concrete. Final finishing shall commence after the bleed water has disappeared and when the concrete has stiffened sufficiently to prevent the working of excess mortar to the surface. Do not add water to finish.

.11 Do not overwork concrete surface. Wood float finish is acceptable.

.12 Do not use steel trowels with air-entrained concrete. For air-entrained concrete, the surface can be further levelled and consolidated with a magnesium bull float for larger repairs or a magnesium trowel for smaller repairs. One or more passes shall be made at suitable time intervals to obtain a level finish free of float marks. Do not work bleed water on the concrete surface into the concrete during finishing.

.13 Tool crack control joints where indicated on Drawings or, if not shown on Drawings, per existing layout.

.14 Cure in accordance with the more rigorous requirements of this Section and manufacturer’s written instructions.

.15 Areas of concrete repair completely through the thickness of the slab shall be patched with concrete, well consolidated, and vibrated into place on to smooth plywood forms with suitable release agents adequately shored from the slab below, to the approval of the Consultant. Once forms have been removed, edges of through slab repair are to be ground, hand patched, etc. as required to produce smooth (form like) transition from new patch material to the existing slab.

.16 Do not allow traffic on newly placed repair patches until 75% of the specified 28-day strength has been reached.

3.3 Concrete Placement – Form and Pump (Pressure Grouting)

.1 On slab soffits and vertical surfaces, place new dense concrete by pressure grouting.

.2 Thoroughly wet prepared surface for a period of one hour prior to placement.

.3 Design forms to resist pressure of contained grout and seal against grout leakage until set.

.4 Forms to be adequately supported to maintain position during grout pumping and setting.

.5 Treat bond line between old and new concrete per grout manufacturer’s specifications to ensure adequate bond.

.6 Pressure fill the repair area with pumpable non-shrink cementitious grout to completely fill the void area and provide a good bond to existing concrete.

.7 Remove all formwork and support brackets to leave a smooth, flush concrete finish after curing. Formwork to remain in place for seven (7) days minimum for curing or longer until concrete has attained 75% of its specified 28-day strength.

.8 Edges of repair areas are to be ground, hand patched, etc. as required to produce a smooth (form-like) transition from the new patch surface to the existing slab to the approval of the Consultant once forms have been removed.

.9 Apply approved curing compound as recommended by manufacturer.

.10 Patch material that is sagged, debonded, porous, honeycombed, or cracked shall be replaced.

3.4 Concrete Placement – Vertical Surfaces (Gravity Grouting)

.1 Ensure formwork is secure and free of debris.

.2 Thoroughly wet the patch area and forms for a period of not less than twenty-four (24) hours prior to concrete placement.

.3 Place new concrete into forms by gravity method and thoroughly consolidate concrete in forms using vibrators or other Consultant-approved method.

.4 Remove all formwork and support brackets to leave a smooth and flush concrete finish after curing. Formwork to remain in place for seven days minimum for curing or longer until concrete has attained 75% of its specified 28-day strength.

.1 Apply approved curing compound as recommended by grout manufacturer as alternative to seven-day cure by formwork if 75% of concrete strength is achieved.

.5 Edges of repair areas are to be ground, hand patched, etc. as required to produce a smooth (form-like) transition from the new patch surface to the existing slab to the approval of the Consultant once forms have been removed.

.6 Concrete repair material that is sagged, debonded, porous, honeycombed, or cracked shall be replaced.

3.5 Concrete Mixing and Placing

.1 Concrete shall be machine mixed unless otherwise stipulated by the manufacturer. Mixing and placing shall be in accordance with CSA A23.1.

.2 Concrete shall be conveyed from the mixer to the place of deposit by methods that will ensure the required quality of concrete. Equipment for conveying the concrete shall be of such size and design as shall ensure a practically continuous flow of concrete at the delivery end without separation of materials.

.3 Concrete shall be deposited in the forms as near as practicable to its final position to avoid re-handling.

.4 Depositing shall be continuous throughout each division and the concrete shall be placed and worked so that a uniform texture will be produced.

.5 No concrete shall be placed later than one half hour after leaving the mixer. No re-tempered concrete shall be allowed.

.6 Mix concrete in accordance with the manufacturer's written instructions.

3.6 Compaction and Vibration

.1 Concrete shall be consolidated by means of sufficient vibrators of adequate size operated by competent workers.

.2 The use of vibrators to transport concrete shall not be allowed.

.3 Concrete shall be thoroughly worked around reinforcement, around embedded items, and into corners.

.4 Compaction and vibration is to eliminate all air and stone pockets that may cause honeycombing, pitting, or planes of weakness.

3.7 Concrete Curing

.1 Ensure manufacturer's recommended curing conditions are maintained over the patch area. The more stringent curing conditions between the manufacturer's written instructions and those outlined in this section will govern unless otherwise agreed upon by the Consultant in writing.

.2 Initiate surface concrete repair wet curing as soon as possible after the concrete has sufficiently set, and no later than 30 minutes after finishing.

.1 Minimum acceptable wet curing method on slab surfaces is installation of pre-saturated filter fabric, burlap, or cotton mats that are covered with soaker hoses and plastic sheeting. Overlap wet-curing mats 150 mm and ballast in place without marring the concrete surface.

.2 Wet curing procedures to be in accordance with manufacturer's written requirements, but shall be no less than a one-day period at a minimum temperature of 10°C. Water shall not be permitted to evaporate from the concrete surfaces at any time within the wet cure period.

.3 Prevent airflow in the space between the wet-curing mats and the plastic sheeting. Protect wet-curing assembly from freezing during cold weather.

.3 Vertical repair patches are also to be wet cured for a duration of seven days by either:

.1 Maintaining formwork in place with form ties loosened and water applied to run down the inside form face after the concrete has hardened to keep the repair surfaces wet.

.2 Removing formwork from vertical surfaces and providing fog misting, light water spray, or application of wet burlap covered with polyethylene to keep the repair surfaces continually wet.

.4 Exposed beam and slab soffit repairs require, as a minimum, misting with a water spray on a daily basis during the wet-curing period, or as often as is necessary to prevent surface dusting.

.5 The use of chemical curing compounds is not permitted.

.6 Protect concrete from the harmful effects of heat, cold, running or surface water, and mechanical shock.

.7 Do not place concrete when air temperature is below 10°C, or without implementing provisions to ensure proper curing of concrete when, in the opinion of the Consultant, there is a possibility of air temperature falling below 10°C. These provisions shall be reviewed by the Consultant and conform to the requirements of CSA A23.1.

.8 Maintain concrete material and forms between 15°C and 32°C until concrete placement whenever the surrounding air is below 5°C. No frozen material or material containing ice shall be used. All existing concrete, reinforcement, forms, and ground that the concrete will contact is to be free from frost.

.9 Maintain a curing temperature above 10°C for a minimum of 24hrs or longer to ensure proper concrete curing per manufacturer requirements. Under no circumstances may dry heat be used. Provide means to humidify the air within the heated enclosure and ensure that moisture requirements for curing are maintained.

.10 Do not allow traffic onto patch until material has adequately cured to its specified 24-hour compressive strength.

.11 The Consultant will have cause to not certify payment for repairs undertaken without adequate wet-curing procedures or that become surface dry during the specified curing period.

3.8 Inspection and Testing

.1 Testing is to conform to CSA A23.2.

.2 Inspection and testing to be conducted by a testing agency designated by the Owner. The Owner will pay costs of inspection and testing described in this section.

.3 Contractor to inform testing agency 24 hours in advance of concrete placement.

.4 Testing shall include:

.1 Preparation and testing of concrete grout cubes or cylinders for compressive strength.

.2 Review manufacturer product data sheets submitted by the Contractor.

.3 Bond testing of concrete repair patches to existing concrete where designated by the Consultant.

.4 Submission of test results to the Owner, the Consultant, and the Contractor.

.5 A minimum of one set of concrete grout cubes (9 cubes) or cylinders (4 cylinders) shall be taken for compressive strength testing for each concrete patch material used each day unless otherwise directed by Consultant. Concrete test samples are to be placed in an area with similar curing conditions to that of the cast concrete.

.5 Testing procedures for concrete shall conform to the following requirements:

.1 Compression tests on concrete shall be carried out in accordance with CSA A23.1 and A23.2. Strength test on approved grout shall consist of nine grout cubes with three cubes tested at seven days and the remainder tested at 28 days. For cylinders, strength tests shall be undertaken on one cylinder each at 3 and 7 days with the remaining two tested at 28 days.

.6 The Contractor shall provide at no additional costs to the Owner:

.1 Samples of all material required for testing.

.2 Cooperation with the execution of concrete testing which shall include protection against injury or loss of grout cubes or cylinders.

.3 Access for the testing agency to test and/ or inspect materials.

.4 Site storage facilities meeting requirements of CSA A23.2 for concrete test specimens prior to removal to laboratory.

.7 Bond Strength:

.1 After the concrete or grout has cured, the testing agency may perform bond strength tests if requested by Consultant.

.2 These cores are to be used for the evaluation of the bond strength of the new concrete to the existing by direct tensile force. The testing agency will drill through patches selected by Consultant.

.3 Failure to achieve a minimum tensile bond strength of 0.9 MPa shall constitute failure of patches.

.4 Contractor to fill all core holes with non-shrink cementitious grout upon completion of the tests.

.8 Contractor shall pay for costs of additional testing as follows:

.1 If Contractor fails to notify testing agency in event of pour cancellation.

3.9 Field Quality Control

.1 The Consultant shall evaluate bonding of fresh patch material to existing concrete after the fresh patch material has cured sufficiently.

.2 The evaluation shall be performed by sounding, using a "chain-drag" or other techniques.

.3 Hollow sounds detected in repair area provide reason to suspect inadequate bonding. Contractor to core these areas to determine bonding adequacy where requested by the Consultant.

.4 Coring shall be through the new concrete and into the existing concrete. Core diameter shall be 75 mm, or as required by the Consultant. Length of cores shall be twice the core diameter or twice the thickness of new concrete, unless otherwise requested by the Consultant.

.5 Scanning is to be completed prior to coring to avoid coring through embedded reinforcing, conduit, or other embedded items.

.6 Cores will be visually inspected after removal and any further testing that is required will be determined by the Consultant.

.7 Contractor to patch core holes.

3.10 Rejection of Defective Work

.1 The Consultant shall have the right to order additional concrete testing of any portion of repairs in accordance with CSA A23.1 if previous testing demonstrates non-conformance with specified requirements. The testing agency shall be selected by the Consultant and shall deal directly with the Consultant. Payment for costs associated with the additional concrete testing will be at the Contractor's expense.

.2 Where it is the Consultant's opinion that material or workmanship fails to meet the specified requirements, the work shall be replaced or repaired to the approval of the Consultant at no additional cost to the Owner.

.3 Bond failure between repair material and the existing concrete, or failure to meet compressive strength requirements based on compression testing of concrete cylinders, will result in drilling of additional core samples at the Contractor's expense. Failure of these additional samples will require the work to be replaced or repaired to the approval of the Consultant at no additional cost to the Owner.

3.11 Record Drawings

.1 Maintain accurate records of the location, size, and concrete placement date for each repair area.

.2 Records to be kept up-to-date and made available to Consultant throughout the duration of the Work.

.3 Prior to Substantial Performance of the Work, provide a plan showing location, size, and date of concrete repairs.

END OF SECTION

1.0 GENERAL

1.1 Work Included

.1 Remove sound and unsound concrete from the chimney and existing building where directed by Consultant and as described herein.

2.0 PRODUCTS

2.1 Equipment

.1 Provide hand-held jackhammers for concrete removal that are capable of efficiently removing sound and unsound concrete without causing excessive or unwanted removal.

.2 Maximum jackhammer size is 15 kg. Light chipping hammers are to be used where the Consultant deems it necessary to reduce the amount of concrete breakage. Maximum light chipping hammer size is 7 kg. The use of light chipping hammers is at no additional cost to the Owner.

.3 Equipment located outside shall be mufflered or placed within an acoustic enclosure to produce maximum operating noise levels of 70 dBa at 3.0 m. Noise levels are also to be in accordance with all local and municipal by-laws and regulations.

.4 Use "silenced" compressors.

.5 Compressors and all diesel-powered equipment are to be fitted with a diesel exhaust scrubber.

3.0 EXECUTION

3.1 Preparatory Work by Contractor

.1 Approximate locations and extents of concrete delamination repairs are shown on the Drawings and are provided as general guidelines only. Actual concrete removal areas to be designated on site by the Contractor.

.2 Contractor shall determine, by visual inspection and hammer-sounding, the locations and extent of deteriorated, delaminated, and unsound concrete to be repaired. The perimeter outlines of the soffit and full-depth slab repair areas shall be marked in chalk by the Contractor. Mark perimeter outlines of full-depth slab delaminations on slab surface, using measurements and a different colour of chalk. Coordinate locations of full-depth slab repair areas with results of surface chain-drag testing.

.3 Notify the Consultant to review and comment on the areas identified for repair. Consultant will review Contractor's chalk-marked outlines, adjust as required, and mark perimeters of actual repair areas using paint. Do not proceed with concrete removal or demolition until Consultant's review has been completed.

3.2 Surface Concrete Removal

.1 Actual concrete removal areas to be designated on site by the Consultant. Minimum depth of removal to be 50 mm at patch boundaries. Delamination sizes and locations as shown on the drawings are provided as general guidelines only.

.2 Remove concrete in areas that are already spalled or that produce a hollow sound under a hammer test, which indicates the presence of concrete delaminations. The areas shall be initially located by the Contractor and marked on the concrete surface with a durable red-coloured paint. The Consultant will then review the markings and mark out the actual area of concrete to be removed.

.3 Take precautions to avoid punching through the slab.

.4 Remove concrete within designated areas to obtain a minimum of 25 mm clearance around all exposed reinforcement within delamination repair. Minimum removal depth shall be 50 mm, which may include sound concrete.

.5 Excess or unnecessary concrete removal to be at no extra cost to the Contract.

.6 Outline patch area with a 13-mm deep vertical sawcut as close as possible to limits of concrete already removed. Reduce sawcut depth if necessary to avoid cutting reinforcement. Remove concrete to sawcut taking precautions to avoid damaging sawcut edge. Edges with spalls or chips will be rejected and shall be re-sawcut at Contractor's expense.

.7 Call for review by Consultant to confirm acceptability of patch preparation prior to cleaning of reinforcement. After concrete removal has been complete, a final check adjacent to the areas shall be made by the Contractor to determine any additional spalling or delamination which may have occurred. Contractor shall mark out these areas and notify Consultant to make a review.

.8 Remove additional concrete required to provide adequate development and/or lap for new reinforcing steel required as directed by the Consultant.

.9 Where the Consultant deems that required concrete removal is excessive adjacent to vertical surfaces, a key is to be chipped into existing columns and walls prior to concrete placement. The key is to have a minimum depth of 40 mm into the vertical element. Install shoring and bracing as required.

3.3 Vertical Surface Concrete Removal

.1 All unsound soffit concrete is to be removed in areas designated by Consultant.

.2 Remove concrete in areas that are already spalled or that produce a hollow sound under a hammer test, which indicates the presence of concrete delaminations. The areas shall be initially located by the Contractor and marked on the concrete surface with a durable red-coloured paint. The Consultant will then review the markings and mark out the actual area of concrete to be removed.

.3 Take precautions to avoid punching through the wall.

.4 Use light chipping hammers for all soffit and vertical concrete removal.

.5 Remove concrete within designated areas to obtain a minimum of 25 mm clearance around all exposed reinforcement within the delamination repair. Minimum removal depth shall not be less than 50 mm, which may include sound concrete.

.6 Unless otherwise specified, do not remove concrete behind vertical reinforcing steel at wall and column locations. Obtain direction from the Consultant once existing reinforcing steel has been exposed if further concrete removal is required.

.7 Upon exposure of visibly corroded or debonded reinforcement, additional concrete removal shall be performed until bars appear to be rust-free for a distance of 75 mm around the perimeter of a patch or until otherwise directed by the Consultant.

.8 Excess or unnecessary concrete removal to be at no extra cost to the Contract.

.9 Outline patch area with a 13-mm deep vertical sawcut as close as possible to limits of concrete already removed. Reduce sawcut depth if necessary to avoid cutting reinforcement. Remove concrete to sawcut taking precautions to avoid damaging sawcut edge. Edges with spalls or chips will be rejected and shall be re-sawcut at Contractor's expense.

.10 Call for review by Consultant to confirm acceptability of patch preparation prior to cleaning of reinforcement. After concrete removal has been complete, a final check adjacent to the areas shall be made by the Contractor to determine any additional spalling or delamination which may have occurred. Contractor shall mark out these areas and notify Consultant to make a review.

END OF SECTION

1.0 GENERAL

1.1 Work Included

.1 Clean and prepare existing reinforcement exposed within concrete repairs and where otherwise designated by the Consultant.

.2 Supplement corroded or damaged reinforcement with new reinforcing steel and accessories, including supply, fabrication, handling, and placing.

1.2 Reference Standards

.1 All Reference Standards are latest editions referenced by the building code in the Place of the Work, or latest editions if not referenced by Code.

.2 Ontario Building Code

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

.4 CSA G30.18 Carbon Steel Bars for Concrete Reinforcement

.5 ACI Manual of Standard Practice for Detailing – 28th Edition

.6 CSA W186 Welding of Reinforcing Bars in Reinforced Concrete Construction

.7 Reinforcing Steel Institute of Canada (RSIC) Manual of Standard Practice

.8 SP-71 (08) ASTM Standards in 318-08

.9 ASTM A775/A775M Standard Specification for Epoxy-Coated Reinforcing Steel Bars

1.3 Product Handling

.1 Protect reinforcement in a manner that prevents excessive rusting and fouling with dirt, grease, form oil, and other bond-breaking coatings.

.2 Reinforcement shall be free from excessive corrosion, mud, oil or other coatings that adversely affect its bonding capacity at the time concrete is placed.

2.0 PRODUCTS

2.1 New Concrete Reinforcement and Accessories

.1 Reinforcing steel bars shall conform to CSA G30.18, 400 MPa grade unless otherwise specified herein or on the drawings. Plain finish.

.2 Reinforcing bars to be welded shall conform to CSA G30.18.

.3 Bar supports shall conform to SP-71: ASTM Standards in 318 unless otherwise approved by the Consultant.

.4 Chairs, bolsters, bar supports, and spacers shall be epoxy coated or plastic. The use of pebbles, pieces of broken stone or brick, pipe, or wooden blocks will not be permitted.

.5 Tie wire for coated or galvanized reinforcing shall be plastic-coated.

3.0 EXECUTION

3.1 Preparation - Reinforcement in Place

.1 Exposed reinforcement and steel shall be completely cleaned of cement paste, corrosion, oil, and contaminants. Dry abrasive-blast clean to near-white blast, completely cleaned of all grease, oil, dirt, mill scale, cement paste, debonded epoxy, etc. Additional cleaning shall be performed if subsequent corrosion occurs after initial cleaning.

.2 Wire brush, grinding, and similar hand-cleaning methods shall not be permitted in lieu of abrasive-blast cleaning of reinforcement, unless approved by the Consultant.

.3 The Contractor may elect to cut, remove, and replace damaged or corroded reinforcement with new reinforcement in lieu of cleaning existing exposed reinforcement, subject to approval of the Consultant. Provide required tension lap splices with existing cleaned reinforcement at no additional cost to the Owner and Consultant’s approval.

3.2 Installation

.1 Replace or supplement damaged or severely corroded reinforcement exposed in concrete delamination repair patches with new plain reinforcement where existing reinforcing steel has a section loss of 20% or greater.

.2 Replace or supplement damaged or severely corroded reinforcement where otherwise directed by the Consultant.

.3 Replacement or supplemental reinforcing bars shall be the same bar size or greater than the original bar.

.4 Additional concrete removal may be required to allow for placement of supplemental reinforcing bars. The length of the supplemental bars shall be equal to the length of the deteriorated segment of the existing bars, plus the required lap splices at each end. Splicing requirements shall be in accordance with indicated Reference Standards. Supplemental bars shall be placed parallel to, and approximately 20 mm from, the existing bars.

.5 Additional concrete removal required for supplemental reinforcement placement will be paid by Owner except where Contractor elects to replace bars in lieu of abrasive-blast cleaning.

.6 Reinforcement that is fully exposed in repair areas for the entire bar length shall be removed and replaced with new reinforcement of the same bar size or greater at no additional cost to the Owner.

.7 Accurately place supplemental reinforcement and secure existing reinforcement exposed in the delamination repair patches to maintain original design layout.

.8 Reinforcement shall be firmly tied and supported by bar supports and side form spacers to ensure proper concrete cover and spacing within allowable tolerances before and during concrete placement.

.9 Bar supports shall be sufficient in number and strength to carry the reinforcement they support and prevent displacement by workers or equipment before and during concrete placement.

.10 Bars shall be tied at all intersections where spacing is greater than 250 mm in each direction and at alternate intersections where spacing is less than 250 mm in each direction.

.11 Bars may be moved as necessary to avoid interference with other reinforcing steel, conduits, and embedded items. If bars are moved more than one bar diameter, or enough to exceed specified tolerances, the resulting arrangement of bars shall be subject to Consultant’s approval.

3.3 Inspection and Testing

.1 No concrete shall be placed until Consultant has reviewed reinforcing in-place. Provide minimum 24 hours of notice of time when reinforcement will be substantially in place and ready for Consultant's review.

.2 Inspection of reinforcement coated in place shall include visual inspection with flashlight and mirror. This inspection shall be first made by the Contractor. When the Contractor is satisfied epoxy coating is in conformance with the Specifications, notify Consultant to review the work.

END OF SECTION

1.0 General

1.1 Work Included

.1 Provide all labour, materials, equipment, and services necessary to supply, erect, and strip all formwork and falsework for poured-in-place concrete shown or indicated on the Contract Drawings and Specifications.

1.2 Reference Standards

.1 All Reference Standards are latest editions referenced by the building code in the Place of the Work, or latest editions if not referenced by Code.

.2 Ontario Building Code

.3	CSA A23.1/CSA A23.2	Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete
.4	CSA S269.1	Falsework and Formwork
.5	ACI SP-004	Formwork for Concrete
.6	ACI 347	Recommended Practice for Concrete Formwork
.7	CSA O86	Engineering Design in Wood (Limit States Design)
.8	CSA O121	Douglas Fir Plywood
.9	CSA O153	Poplar Plywood

1.3 Submittals

.1 Submit shop drawings for falsework and formwork that indicate the method, sequence, and schedule of construction shoring, stripping, and re-shoring.

.2 Indicate formwork and falsework design data, including design loads, for Consultant review. Consultant review does not relieve the Contractor of responsibility for formwork and safety during construction.

.3 Shop drawings submittals shall bear the stamp and signature of a qualified Professional Engineer registered or licensed in the Province of Ontario.

1.4 Handling Requirements

.1 Protect formwork materials before, during, and after installation. Protect installed work and materials of other Sections.

.2 In the event of damage, make required repairs or replacements to Consultant's requirements at no additional cost to the Owner.

2.0 PRODUCTS

2.1 Formwork Materials

.1 Form Material:

.1 Exposed Surfaces: Use metal forms, plywood forms, or plywood lined forms of sufficient structural strength. Plywood to be to CSA O121 or CSA O153. Plywood lining to be new GIS exterior grade fir plywood manufactured with waterproof glue.

.2 Unexposed Surfaces: Use metal forms, plywood forms, or wood lumber. Plywood to be to CSA O121 or CSA O153. Wood lumber to be to CSA O86.

.3 Plywood and Wood Formwork Materials: Material to be to CSA S269.1. Material is to be free from warping and sawn straight so that lines and shapes are accurately retained.

.4 Formwork for unexposed surfaces shall be made with a good grade of lumber or plywood and fitted so that there is no leakage of mortar.

.2 Ties and Spreaders:

.1 Form ties shall be adjustable in length to permit tightening of forms. Use only the snap-off type of form tie that will leave no metal within 25 mm of the concrete surface after removal. Twisted wire form ties are not acceptable.

.3 Form Release Agent:

.1 Form release agent shall be a Consultant-approved chemical agent that is not an oil-based product.

3.0 EXECUTION

3.1 Formwork

.1 Lines and Levels

.1 Verify lines, levels, and column centers before proceeding with work and ensure that dimensions agree with Drawings.

.2 Coordinate forming and setting of recesses, chases, sleeves, inserts, bolts, and hangers.

.2 Design

.1 Design, construct, and erect formwork in accordance with CSA A23.1, CSA S269.1, ACI 347R, and all applicable construction safety regulations at the Place of Work.

.2 Build forms sufficiently strong and rigid to sustain the weight or fluid pressure of the concrete without noticeable deflection. Ensure forms are fitted sufficiently tight to prevent mortar leakage.

.3 The Contractor shall be responsible for design and construction of falsework.

.4 Do not exceed the safe live load of the structure, considering the strength and age of the concrete, with any construction or shoring loads.

.5 Provide 20 mm x 20 mm chamfer strips at exposed corners or edges of columns, walls, beams, and slabs.

.3 Construction:

.1 Construct forms so that the finished concrete will conform to the shape and dimensions shown on the Drawings.

.2 Construct forms so that they may be dismantled and removed without damaging the concrete.

.3 Set shores on wedges or use adjustable shores so they may be removed without causing undue strains in the concrete.

.4 Provide temporary openings at the bottom of column and wall forms to facilitate cleaning and review. Use water to flush out cuttings, shavings, debris, snow and ice, and foreign matter. Ensure that water and debris fully drain to the exterior through clean-out ports, and close the openings with a patch, flush on the inside.

.5 Notify the Consultant when formwork is completed and cleaned to allow for review.

.4 Treatment of Forms:

.1 Install form release agent on form surfaces and allow to dry before placing reinforcing steel, anchoring devices, and embedded parts.

.2 Keep untreated forms wetted down to prevent shrinkage before placing concrete and wet surfaces without allowing ponding at time of placing concrete.

.5 Alignment:

.1 Provide suitable means for checking the alignment and elevation of formwork and check frequently during concrete placement.

.2 Carry out corrective wedging as required until concrete is in place.

.3 Remove concrete that becomes misaligned during placing to satisfaction of Consultant.

.4 Align forms to ensure movement and deflections of the finished product are confined.

.5 Tolerances for all concrete work shall conform to the requirements of CSA A23.1 and ACI 347.

.6 Camber formwork for slabs and beams to provide cambers shown on Drawings. Make allowances for settlement of forms, closure of form joints, and elastic shortening of forms and add to indicated camber requirements.

.6 Stripping:

.1 Do not remove shoring or strip formwork until the concrete has gained sufficient strength to carry dead loads and construction loads that are likely to be imposed. Notify the Consultant before removing formwork.

.2 Remove falsework progressively in accordance with CSA S269.1. Ensure that no shock loads or unbalanced loads are imposed upon the structure during removal.

.3 Loosen forms carefully using a method that prevents spalling and damage to the concrete surface and edges. Do not use wedge pry bars, hammers, or other tools against exposed concrete surfaces.

.4 Leave forms loosely in place for protection until curing requirements are complete.

.5 Completely remove forms from under steps and within void spaces. Provide temporary openings, if necessary.

.6 Remove metal spreader ties on exposed concrete by removing or snapping off inside the wall surface. Point up and patch the resulting pockets flush to surrounding areas.

.7 Re-Use of Formwork:

.1 Forms may be re-used after adequate cleaning if the surfaces are not cracked or roughened. The formwork shall be trimmed and properly patched to provide a smooth surface.

END OF SECTION

1.0 GENERAL

1.1 Work Included

.1 Provide all labour, materials, equipment, and services necessary to supply and install new reinforcing steel work shown on indicated in all the Contract Drawings and Specifications, including accessories such as hanger bars, spirals, wire ties, support bars, chairs, spacers, supports, or other devices required to position reinforcing properly.

1.2 Reference Standards

.1 All referenced Standards are latest editions referenced by the Building Code in the Place of the Work, or latest editions if not reference by Code.

.2 Ontario Building Code

.3	CSA A23.1/CSA A23.2	Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete
.4	CSA A23.3	Design of Concrete Structures
.5	CSA G30.5	Welded Steel Wire Fabric for Concrete Reinforcement *(Withdrawn)*
.6	CSA G30.18	Carbon Steel Bars for Concrete Reinforcement
.7	ASTM A767/A767M	Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement
.8	ASTM A775/A775M	Standard Specification for Epoxy-Coated Steel Reinforcing Bars

.9 American Concrete Institute (ACI) Manual of Standard Practice for Detailing Reinforced Concrete Structures

.10 Reinforcing Steel Institute of Canada (RSIC) Manual of Standard Practice

.11	CSA S413	Parking Structures
.12	SP-71	ASTM Standards in 318-08
.13	CSA W186	Welding of Reinforcing Bars in Reinforced Concrete Construction

1.3 Submittals

.1 Mill Tests:

.1 Upon request, provide the Consultant with a certified copy of mill tests of steel supplied, showing physical and chemical analysis, minimum two weeks prior to commencing reinforcing work.

.2 Shop Drawings:

.1 Prepare shop drawings for concrete reinforcement, bar support and accessories in accordance with RSIC Manual of Standard Practice.

.2 If requested by the Consultant, submit shop drawings in accordance with the General Requirements.

.3 Shop drawings shall clearly indicate bar sizes, grades, spacing, location, bending details, quantities of reinforcing mesh, bar supports, mechanical splices, accessories, and identifying code marks to permit correct placement without reference to structural drawings.

.4 Placing drawings and bar lists will be reviewed for number and size of bars only. The Consultant's review of reinforcing shall be a visual inspection of in-situ work as required to determine general conformity to the engineering drawings. The Consultant’s review shall in no way relieve the Contractor of their responsibility for carrying out the Work in accordance with the drawings.

.5 Substitution of imperial reinforcing sizes and grades will only be accepted if drawings showing imperial sizes are submitted to the Consultant for review. Approval must be obtained before any work is commenced.

1.4 Product Delivery, Storage, and Handling

.1 Store and protect reinforcement in a manner to prevent excessive rusting and fouling with dirt, grease, form-oil, and other bond-breaking coatings.

.2 Reinforcement at the time concrete is placed shall be free from excessive rusting, mud, oil, or other coatings that adversely affect its bonding capacity.

.3 Special care shall be taken when handling epoxy-coated reinforcing steel to prevent damage to the epoxy coating. Bundle and transport epoxy-coated reinforcement in accordance with ASTM A775/A775M. Epoxy-coated reinforcing bars shall not be dropped or dragged, and shall be lifted with spreaders and non-metallic slings. Bar-to-bar abrasion and excessive handling of bundles must be prevented.

.4 The contractor shall repair all damages to the epoxy coating using a manufacturer's approved epoxy patching materials. If damaged areas rust before being repaired, the rust shall be completely removed before the steel surfaces are repaired.

.5 Coat cut ends of epoxy coated reinforcing with approved epoxy patching material.

2.0 PRODUCTS

2.1 Materials

.1 Reinforcing steel bars shall conform to CSA G30.18 (grade 400 MPa) unless otherwise specified herein or on the drawings. Plain finish.

.2 Reinforcing bars to be welded shall conform to CSA G30.18.

.3 Welded wire fabric shall conform to CSA G30.5. Sizes and gauges as shown on the drawings.

.4 Bar supports shall conform to ACI 316 unless otherwise approved by the Consultant.

.5 Chairs, bolsters, bar supports, and spacers shall be epoxy coated or plastic. The use of pebbles, pieces of broken stone or brick, pipe, or wooden blocks will not be permitted.

.6 Tie wire for coated reinforcing shall be plastic-coated.

.7 Mechanical splices to Consultant's approval.

2.2 Fabrication

.1 Fabricate reinforcing to CSA A23.1 and reviewed shop drawings.

.2 Fabricate reinforcing steel within the following tolerances:

.1 Sheared length plus or minus 25 mm

.2 Depth of truss bar plus or minus 10 mm

.3 Outside dimension of stirrups, ties and spirals, plus or minus 10 mm

.4 Other bends plus or minus 25 mm

.3 Colour-code each bar to correspond with code mark appearing on bar list.

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

.5 Bars shall not be field bent, straightened, or re-bent, except where indicated or authorized by the Consultant. When field bending is authorized, bend without heat, applying slow and steady pressure. Replace bars that develop cracks or splits.

.6 Splicing of reinforcing bars, unless indicated on the drawings, is prohibited except with the written approval of the Consultant. Such splices shall conform to the splice length for that class of splice according to CSA A23.3. Splices, where possible, shall be staggered.

.7 Fabrication, handling, and shipping of epoxy-coated steel shall conform to CSA S413.

3.0 EXECUTION

3.1 Installation

.1 Reinforcement shall be accurately placed in the positions shown on the drawings, firmly tied, and supported by bar supports and side form spacers to assure proper concrete cover and spacing within allowable tolerances before and during placing of concrete.

.2 Bar supports shall be sufficient in number and strength to carry the reinforcement they support and prevent displacement by workers or equipment before and during concreting. Bars shall be tied at all intersections, except where spacing is less than 250 mm in each direction, when alternate intersections shall be tied.

.3 Bars shall be placed to the following tolerances unless noted otherwise.

.1 Clear concrete protection of reinforcement 5 mm ±.

.2 Where the depth of a flexural member, thickness of a wall or smallest dimension of a column is:

.1	200 mm or less	5 mm ±.
.2	larger than 200 mm but less than 600 mm	10 mm ±.
.3	600 mm or larger	20 mm ±.

Lateral spacing of these bars shall be within 30 mm ± of the specified spacing.

.3	For longitudinal location of bends and ends of bars	50 mm ±.
.4	As Item 3 at discontinuous ends of members	20 mm ±.
.5	Specified spacing between bars	10 mm ±.

.4 Bars may be moved as necessary to avoid interference with other reinforcing steel, conduits or embedded items. If bars are moved more than one bar diameter or enough to exceed the specified tolerances, the resulting arrangement of bars shall be subject to approval of the Consultant.

3.2 Inspection and Testing

.1 No concrete shall be placed until the Consultant has completed their review of reinforcing in place. The Contractor shall provide a minimum of 24 hours notice of the time when the reinforcement will be substantially in place and ready for the Consultant’s review.

.2 Inspection and testing of factory-coated reinforcement to be conducted by a testing agency designated by the Consultant. The Owner will pay cost of inspection and testing described in this Section.

.3 Inspection and testing of reinforcement coated in place shall include visual inspection with flashlight and mirror.

END OF SECTION

1.0 GENERAL

1.1 Section Includes

.1 Provide the necessary labour and materials to install a new 2-ply SBS modified bitumen roofing membrane system as shown on the drawings and described herein.

1.2 Reference Standards

.1 All referenced Standards are latest editions referenced by the Building Code in the Place of the Work, or latest editions if not referenced by Code.

.2 Ontario Building Code

.3 Canadian Roofing Contractors Association (CRCA) Roofing Practices Manual

.4	ASTM D6162/D6162M	Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements
.5	ASTM D6163/D6163M	Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements
.6	ASTM D6164/D6164M	Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements
.7	ASTM D5957	Standard Guide for Flood Testing Horizontal Waterproofing Installations
.8	ASTM D41/D41M	Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
.9	ASTM D449/D449M	Standard Specification for Asphalt Used in Dampproofing and Waterproofing
.10	ASTM E108	Standard Test Methods for Fire Tests of Roof Coverings
.11	CAN/CGSB-51.33-M89	Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction (Withdrawn)

.12	CAN/ULC-S706	Standard for Insulating Wood Fibre Boards for Buildings
.13	CAN/ULC-S701.1	Standard for Thermal Insulation, Polystyrene Boards
.14	CAN/ULC-S704.1	Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced
.15	CGSB 37-GP-56M	Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing (Withdrawn)
.16	CSA A123.23	Product Specification for Polymer-Modified Bitumen Sheet, Prefabricated and Reinforced
.17	CSA B111	Wire Nails, Spikes and Staples (Withdrawn)
.18	CSA A123.4	Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems
.19	CSA A231.1/A231.2	Precast Concrete Paving Slabs / Precast Concrete Pavers
.20	CSA A123.21	Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane-Roofing Systems

1.3 Submittals

.1 CSA A123.21 Test Report: Submit test report showing that full roof assembly has been tested to CSA A123.21. Dynamic wind uplift resistance per CSA A123.21 must exceed specified wind loads outlined in Article 1.5 Performance Requirements.

.2 Submit product data on material characteristics, performance criteria, limitations for each product to be used.

.3 Submit certificate that installer is approved by membrane manufacturer for methods and materials specified.

.4 Maintenance Data: Submit data covering the care, cleaning, and maintenance.

.5 Warranty Documentation:

.1 Submit warranty documentation confirming that manufacturer has been notified of project and warranty application process has started. Submit prior to starting work.

1.4 Quality Assurance

.1 Contractor must be a member in good standing with Ontario Industrial Roofing Contractors Association (OIRCA).

.2 Applicators must be certified by membrane manufacturer.

.3 Foreperson shall have minimum five (5) years of experience in roofing industry.

.4 Ensure at least one journeyperson roof installer is on site at all times.

1.5 Performance Requirements

.1 Finished roof assembly shall not pond water.

.1 For purposes of this test, “Ponding Water” is build-up of more than 6 mm (1/4”) or area greater than 600 x 600 mm that does not dissipate within 48 hr of rain or snowfall event outside of drain sump.

1.6 Mock-Up

.1 Construct mock-up of roof system in location acceptable to Consultant showing typical lap joint, corner, etc. prior to installation of roofing system.

.2 Arrange for Consultant’s review during construction of mock-up minimum 48 hours in advance.

.3 Mock-up may remain as part of the Work if accepted by Consultant.

.4 Do not commence roof installation until Consultant has reviewed mock-up.

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

1.7 Notification and Testing

.1 Notify Consultant at least 48 hours before commencement of any roofing work.

.2 Notify Consultant each morning that work is occurring and what roofing activities are taking place.

.3 Consultant reserves the right to have cut tests made to establish quality of work. Such tests shall be made in the presence of Contractor. Cost of tests and subsequent repairs shall be borne by Contractor.

.4 Notify Consultant in event that Specifications conflict with manufacturer's recommendations.

.5 Review and testing service does not relieve Contractor of responsibility for quality control of production and for errors made by them.

1.8 Environmental and Safety Conditions

.1 Comply with requirements of WHMIS regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of safety data sheets by applicable legislation.

.2 Roofing application shall not be carried out when materials are damp or when ambient temperatures are less than manufacturer's specifications.

.3 Be responsible for safe disposal of debris from job site and in compliance with Canadian Environmental Protection Act.

.4 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of products including special conditions governing use.

.5 No Torching allowed on site.

1.9 Delivery, Storage, and Handling

.1 Deliver and store materials in their original packaging bearing manufacturer's name, grade, weight, and applicable standards.

.2 Ensure shelf life of materials has not elapsed.

.3 Store material in accordance with manufacturer's recommendations.

.4 Remove from site any damaged material or material exposed to wet weather.

.5 Do not overload structure or adjacent structures.

.6 Store membrane rolls on ends with selvage edge up, one pallet high only.

.7 Maintain rolled membranes at temperature recommended by manufacturer prior to use.

.8 Store solvent-based liquids, adhesives, and primers away from excessive heat and open flames and at temperatures recommended by manufacturer.

.9 Gypsum Sheathing

.1 Cover with opaque polyethylene film or light-coloured tarpaulins.

.10 Metal Flashings and Trim

.1 Transport, handle, and store assembled units and/or their component parts in a manner to preclude damage of any nature.

.2 Stack preformed material in manner to prevent twisting, bending, and rubbing.

.3 Remove units or components that are stained, watermarked, cracked, bent, chipped, scratched, or otherwise unsuitable for installation and replace with new.

.4 Protect finish and edges in accordance with manufacturer's recommendations.

.5 Prevent contact of dissimilar metals during storage and protect from acids, flux, and other corrosive materials and elements.

1.10 Warranty

.1 Refer to Section 01 78 36.

.2 Contractor Warranty

.1 OIRCA Warranty: Remedy material and workmanship defects in modified bituminous membrane roofing system, including but not limited to roof assembly, membrane flashings, metal flashings, and sealants, that appear within two years from date of Substantial Performance of the Work.

.1 To be standard form of warranty issued on letterhead from Ontario Industrial Roofing Contractors Association (OIRCA).

.3 Manufacturer's System Warranty:

.1 Obtain ten (10) Manufacturer System Labour, Material, and Workmanship Warranty. Inspections to be provided by system manufacturer's representatives. Manufacturer to review Drawings and Specifications prior to work.

2.0 PRODUCTS

2.1 Sheathing Board Adhesive

.1 Polyurethane adhesive for sheathing board, insulation boards and overlay boards.

.1 Ribbons of two (2) component polyurethane foamable adhesive:

.1 JM Two-Part UIA by JM.

.2 IKO Millennium adhesive by IKO Industries Ltd.

.3 Duotack by Soprema.

.4 Accepted Alternate

2.2 Sheathing Board

.1 Gypsum Board: ASTM C1177/C1177M, glass-mat, water-resistant gypsum substrate, minimum 13 mm thick. Acceptable products:

.1 Dens Deck Prime by Georgia Pacific Canada Ltd.

.2 Securerock Glass-Mat Roof Board by CGC Inc.

.3 DEXcell FA by JM

.4 Accepted Alternate

2.3 Primers

.1 Asphalt Primer: To ASTM D41/D41M, VOC content as recommended by manufacturer.

.2 Primer for Reinforced Liquid Flashing Membrane: Translucent cloudy two-component polymethyl methacrylate-based (PMMA) primer. Acceptable products:

.1 JM SA Primer by JM.

.2 IKO S.A.M. Adhesive by IKO Industries Ltd.

.3 Elastocol Stick by Soprema.

.4 Approved Alternate.

2.4 Vapour Retarder

.1 Single-ply self-adhered bituminous membrane consisting of:

.1 Minimum 0.8 mm SBS modified bitumen with silicone release film. Acceptable products:

.1 Basis of Design: Sopravap'R by Soprema or approved substitution

.2 JM SAR Vapor Barrier b JM

.3 IKO MVP Sand by IKO Industries Ltd.

.4 Accepted Alternative

2.5 Base Insulation (Tapered)

.1 Polyisocyanurate insulation to CAN/ULC-S704, min. thickness to match the existing , Type 2 Class 1, Grade 2 to ASTM C1289 manufactured using HCFC-free blowing agents and integrally laminated to heavy, non-asphaltic, fiber reinforced, glass fibre facers. Maximum panel dimension shall be 1,219 mm (48"). Install in two layers minimum, with joints staggered 300 mm (12") between layers. Acceptable Products:

.1 Sopra-Iso by Soprema

.2 IKOTherm by IKO Industries Ltd.

.3 ENRGY 3 by JM.

.4 Accepted Alternative

.2 Fibrous glass batts, friction fit, unfaced to CAN/ULC S702 latest edition.

.3 Tapered Insulation

.1 Material to match base insulation.

.2 Modules shall be factory-cut to correct slopes and clearly marked to match shop drawings.

.3 Valley corners shall be factory mitred.

.4 Slope to zero insulation to be used at slope transitions. Acceptable Product:

.1 Base insulation products

.2 Accu-Plane

.3 Posi-slope

2.6 Insulation Overlay Board

.1 Fibreboard: Asphalt treated and coated to CAN/ULC-S706, Type 1, square edges, 12.7 mm (1/2”) thick.

.1 Acceptable products:

.1 Basis of Design: 1/4” Sopraboard in Duotack, by Soprema Inc.

.2 DEXcell FA by JM

.3 IKO Protectoboard by IKO Industries Ltd.

.4 Approved equivalent.

2.7 Insulation and Insulation Overlay Board Adhesive

.1 As recommended by insulation and overlay board manufacturer.

2.8 Modified Bitumen Membrane

.1 Two ply system made from prefabricated modified bitumen membranes containing minimum 11% of elastomer Styrene Butadiene Styrene (SBS) and reinforced with non-flammable, fireproof and stress-resistant insert of glass fibre and polyester composite.

.1 Cap Sheet and Cap Sheet Flashing/Stripping:

.1 Properties:

.1 Application: Cold-Adhesive.

.2 Type III, Grade 3 in accordance with ASTM D6162. Class A in accordance with ASTM E108, Grade 1 in accordance with CSA A123.23.

.3 Reinforcing: Reinforced with composite polyester/glass fibre mat.

.4 Thickness: Minimum individual membrane thickness of 2.8 mm to CSA A123.23.

.5 Bottom Surface: Sanded.

.6 Top Surface: Granulated.

.7 Colour: Selected by Owner.

.2 Acceptable Products:

.1 DynaLastic 250 by Johns Manville

.2 Modiflex MP-250-Cap by IKO Industries Ltd.

.3 Colply Traffic Cap by Soprema Inc.

.4 Approved equivalent.

.2 Base Sheet and Base Sheet Stripping:

.1 Properties:

.1 Application: Cold Adhered

.2 Reinforcing: Composite polyester/glass fibre mat

.3 Thickness: Minimum individual membrane thickness of 3.0 mm to CSA A123.23.

.4 Bottom Surface: Sanded

.5 Top Surface: Sanded.

.2 Acceptable Products:

.1 DynaBase by Johns Manville

.2 Modiflex MP-180-SS-Base by IKO Industries Ltd.

.3 Colply Base 410 by Soprema Inc.

.3 Low Temperature Requirements: Material to pass low temperature requirements before and after heat aging at -25°C to CSA A123.23 and manufacturer’s instruction.

2.9 Accessories

.1 Adhesives: As recommended by manufacturer of materials being adhered, for applicable ambient conditions.

.2 Roofing Nails: To CSA B111, Table 12, of galvanized steel or aluminum, sufficient length to penetrate wood substrate at least 25 mm.

.3 Termination Bar: 25 mm wide, 0.67 mm galvanized steel or 1.5 mm aluminum, double hemmed, fastened at 200 mm (8”) o.c., installed at all vertical or overhead terminations.

.4 Material Fasteners: Corrosion-resistant screws and hexagonal steel plates. Stainless steel, DT2000 coating by Leland or similar. HDPE, PVC, or Galvalume insulation plates.

3.0 EXECUTION

3.1 Protection

.1 Cover walls and adjacent work where materials hoisted or used.

.2 Use warning signs and barriers. Maintain in good order until completion of work.

.3 Dispose of rainwater away from face of building until drains or hoppers are installed and connected.

.4 Protect new and existing roofing from traffic and damage. Minimum protection to be plywood over rigid insulation or drainage mat.

.5 At end of each day’s work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage.

.6 Protect adjacent parts of building from damage caused by roofing operation. Cover walls and other surfaces in the vicinity of hoisting apparatus with heavy canvas or other suitable protective material. Repair damage caused under this contract to match original material and appearance.

.7 Protect as required to prevent water infiltration or environmental damage and protect exposed edge age to building interior.

3.2 Precautions

.1 Postpone roofing work when inclement weather appears imminent. Minimum temperature for solvent-based adhesive is 5°C or per manufacturer written instructions.

.2 Apply each part of roofing system only when surfaces are clean and dry.

.3 Locate equipment and materials in areas designated by Consultant or Owner.

.4 Conduct operations to leave deck exposed for minimum period of time. Protect, as required, to prevent water infiltration or environmental damage to building interior.

.5 All aspects of roofing operation shall follow in close sequence. No part of operation shall be far ahead of succeeding part such that the latter cannot be finished that working day.

.6 Erect and maintain safety fences around tall equipment and material. Kettles shall be attended at all times.

.7 Take precautions to minimize introduction of asphalt fumes to interior space. Coordinate with Owner to close air intakes where practical.

.8 Contractor is responsible for disconnection, relocation, and reinstallation of existing mechanical and electrical services and equipment.

Ensure that Owner is aware of any such work that may impact interior environment of building, prior to disconnection or shut down.

.9 Disconnection and reconnection of electrical services to meet latest regulations of Canadian Electrical Code and applicable Municipal and Provincial Codes and Regulations. In each and every instance of application, Code, Regulation, Statute, By-Law, or Specification, the most stringent requirements shall apply.

.10 Provide Owner with a schedule indicating time and dates for work creating a disruption to interior environment and obtain Owner’s written approval.

.11 Any sharp projections that may penetrate the membrane, in opinion of Consultant, shall be grounded smooth and flush.

.12 All aspects of the roofing operation shall follow in close sequence. No part of the operation shall be far ahead of the succeeding part that the latter cannot be finished that working day.

3.3 Workmanship

.1 Do work in accordance with applicable standard in Canadian Roofing Contractors Association Roofing Specifications Manual.

3.4 Substrate Preparation

.1 Roof deck and existing roof construction shall be structurally sound to provide support for new roof system. Notify Consultant to review condition of deck prior to new roof assembly installation. Notify Consultant of rusted or deteriorated decking to determine method of treatment or replacement.

.2 Remove existing membrane, flashings, cants, and wood blocking and sweep clean. Remove only amount of roofing and flashing that can be made watertight with new materials during workday or before onset of inclement weather.

.3 Substrate surface shall be firm and free from dust, loose material, excess moisture, and oil-based curing agents.

.4 Prepare substrate surface in accordance with membrane manufacturer’s written instructions or this Specification, whichever is more stringent.

3.5 Sheathing Board Installation

.1 Install gypsum sheathing over deck.

.2 Install boards with long sides at right angles to deck flutes.

.3 Terminate ends of boards on top of flutes.

.4 Adhere sheathing board in beads of foam adhesive to metal roof deck per manufacturer’s written instructions. Beads to be minimum 1/2” to 3/4” and spaced maximum 6” apart. Do not allow foam to skin over.

.5 Install gypsum sheathing to interior of access hatch and curbs to tie into existing interior finishes as indicated on Drawings.

.6 Install joint tape over joints in gypsum sheathing.

3.6 Primer Application

.1 Apply at rate designated by manufacturer.

3.7 Vapour Retarder Installation

.1 For Self-Adhering Vapour Retarder:

.1 Prime deck as recommended by vapour retarder manufacturer.

.2 Install membrane with minimum 75 mm (3”) side laps and 150 mm (6”) end laps. Support end laps with a strip of sheet metal between deck and membrane in accordance with manufacturer’s requirements. At end of roll, affix metal plate 6” (15 cm) x width of roll to support vapour retarder end lap between metal flutes, or trim back membrane to be on top of metal flutes if possible.

.3 Apply pressure to membrane surface to ensure adequate adhesion. Avoid fish mouths, buckles, or any other application defect. Stagger end laps by minimum 12” (300 mm).

.4 Roll membrane per manufacturer’s requirements.

.5 Extend vapour retarder down edges to tie-into sheathing membrane and extend up verticals to tie into 2-ply roofing membrane minimum 2”.

.6 Vapour retarder detailing to maintain integrity of vapour retarder continuity for the building.

.7 Overhang vapour retarder at all edges and extend up verticals 400 mm (16”) minimum. Wrap over ends of insulation boards at roof perimeter and penetrations.

.8 Ensure that vapour retarder at roof edges and vertical building surfaces maintains, together with wall vapour retarder, integrity of vapour retarder system for the building.

3.8 Insulation Installation

.1 For fully adhered cold-adhesive attachment:

.1 Install insulation to meet thickness as existing and R-Value not less than the existing.

.2 Stagger joints in boards minimum 12” (300 mm) for adjacent layers and adjacent rows and fully adhere using adhesive.

.3 Adhere insulation boards in beads of foam adhesive per manufacturer's written instructions. Beads to be minimum 1/2" to 3/4" and spaced maximum 6" apart. Do not allow foam to skin over.

.4 Insulation fillers installed for thermal continuity to be fully adhered in place.

3.9 Insulation Overlay Board Installation

.1 Install overlay over insulation as detailed on Drawings.

.2 Install overlay board with long sides at right angles to underlying insulation.

.3 Stagger joints in boards minimum 300 mm (12").

.4 Adhere insulation boards in beads of foam adhesive per manufacturer's written instructions. Beads to be minimum 1/2" to 3/4" and spaced maximum 6" apart. Do not allow foam to skin over.

3.10 Base Sheet Installation

.1 For cold adhesive applied base sheet:

.1 Commencing at lowest point of roof and perpendicular to roof slope, embed base sheet into cold adhesive as per manufacturer's written recommendations. Apply base sheet with 75 mm (3") side laps and 150 mm (6") end laps. Extend base sheet up vertical, to a point as detailed on Drawings.

.2 Seal joints.

.3 Heat weld all lap joints by heat softening the membrane and pressing the edge of the membrane firmly with a roofing trowel.

.4 Adhere laps with adhesive and hot air welder as recommended by manufacturer.

3.11 Cap Sheet Installation

.1 For self-adhered and cold adhesive-applied cap sheets:

.1 Plan membrane application so that laps are not superimposed over laps of base sheet. Mark chalk line where first course is to start. Unroll 2.0 m to 3.0 m of membrane and line it up to chalk line or selvage edge. Reroll and commence application by applying primer or cold adhesive. If roll goes out of line by more than 12 mm (1/2”), cut and realign.

.2 Adhere one-ply of membrane. Constantly check adhesion to ensure proper bonding is achieved. Apply pressure to surface of membrane with weighted roller.

.3 Side laps shall cover selvage edge and be minimum 75 mm (3”). End laps shall be 150 mm (6”).

.4 Seal joints.

.5 Adhere laps with adhesive and hot air welder as recommended by manufacturer.

.6 At sloped roofs greater than 3%, install membrane with seams perpendicular to roof slope and nail at top and follow manufacturer’s requirements.

.7 Ensure cap sheet is unrolled to enable membrane to relax prior to installation for the amount of time required by weather conditions

3.12 Membrane Flashings and Sheet Stripping Installation

.1 Install flashing membrane in accordance with specific system requirements. Terminate flashing as shown on Drawings in accordance with manufacturer’s instructions. Install flashing in meter wide pieces. Cut pieces to fit prior to installation; do not install then trim.

.2 Plan for flashing membrane installation so laps are not superimposed over laps of underlying membrane.

.3 Extend flashing/stripping vertically minimum 200 mm beyond horizontal field surface.

.4 Overlap base sheet flashing over horizontal field base sheet membrane minimum 100 mm.

.5 Overlap cap sheet flashing over horizontal field cap sheet membrane minimum 150 mm.

.6 Overlap flashing membrane side laps minimum 75 mm.

.7 Install reinforcing gussets at inside and outside corners in accordance with manufacturer's recommendations.

.8 Base sheet flashing/stripping shall be fully adhered over roof membrane and vertical surface in accordance with manufacturer's instructions and application rates. Cap sheet flashing shall be fully adhered over base sheet membrane with specified overlap in accordance with manufacturer's instructions and application rates.

.9 Nail flashings at location and spacing shown on Drawings.

.10 Secure membrane flashings to verticals with continuous securement strips installed along top edge of membrane flashings and fastened at 200 mm or as indicated on Drawings o.c. Lap strips to selvage minimum 75mm and seal laps securely.

.11 Embed granules for preparation of salvage edges where membrane will overlap mineral surface.

.12 Using propane torch, heat back of flashing strip until coating flows and bonds to roof and up vertical. Press in firmly for proper adhesion. Continue by bonding upper portion to wall, taking precautions not to stretch membrane.

.13 After membrane has cooled, use neoprene roller and press over installed membrane to ensure it is adhered.

.14 At head laps where "T" joints occur, cut corner of membrane to be overlapped on a 45-degree angle. Apply manufacturer-approved mastic to cover granule portion at overlap areas and to fill step where membrane "T" overlaps.

3.13 Metal Flashings

.1 Refer to Section 07 62 00.

3.14 General

.1 Patch cap sheet membrane utilizing patches with minimum size of 900 mm (36") x 900 mm (36")

.2 Minimum length of cap sheet on flat run of roof to be 900 mm (3 ft.)

.3 Discard cap sheet rolls with damaged or deformed ends.

.4 Following completion of new roofing, soften and apply liberal application of manufacturer-approved bulk type mineral granules to cap sheet membrane edges where asphalt has extruded or flowed beyond clean lines and to surface damage.

.5 Remove splices in delivered rolls. Cut roll back 400 mm (16”) on both sides of splices.

3.15 Completion of Day’s Work

.1 Leave no openings for water ingress into roof assembly. Install water cut-offs at end of each day’s work, remove completely prior to continuing further roofing applications.

.2 Do not incorporate temporary roofing membranes into main roof system. Remove membranes utilized for this purpose and discard.

.3 Inspect laps of membrane application to ensure they are properly bonded. Repair deficiencies before leaving site for day.

.4 Leave no base sheet exposed overnight unless seams are sealed before leaving site.

.5 Progressively remove from site debris created by execution of Work and dispose of at certified disposal location. Proof of disposal location may be requested.

3.16 Field Quality Control

.1 Review and testing of membrane roofing and associated work will be done by agency appointed and paid for by Owner. Notify Consultant at least 48 hours before commencement of roofing work.

.2 Consultant may perform cut tests to establish quality of work. Such tests will be made in presence of Contractor. Cost of tests and subsequent repairs shall be borne by Contractor.

.3 Notify Consultant in event that Specifications conflict with manufacturer’s recommendations.

.4 Review and testing service does not relieve Contractor of responsibility for quality control.

3.17 Cleaning

.1 Dispose of roofing materials, trash, debris, equipment and excess material from the building and surrounding areas. Any trash and debris removal shall comply with provincial and local codes and requirements.

.2 Repair, replace and clean damaged or soiled building components resulting from the Work of this section to the satisfaction of the Consultant and Owner.

.3 Ensure the cleanliness and proper function of roof drains.

END OF SECTION

1.0 GENERAL

1.1 Reference Standards

.1 All referenced Standards are latest editions referenced by the Building Code in the Place of the Work, or latest editions if not referenced by Code.

.2 Ontario Building Code

.3 Application Standards Manual.

.4 CRCA Roofing Specifications Manual

.5 ASTM International

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

.6 Canadian General Standards Board (CAN/CGSB)

.1	CAN/CGSB 37.5	Cutback Asphalt Plastic Cement (Withdrawn)

.7 Canadian Roofing Contractors Association (CRCA)

.1	Roofing Specifications Manual 2012	

.8 Canadian Sheet Steel Building Institute (CSSBI)

.1	S8	Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products
.2	B17-2002	Barrier Series Prefinished Steel Sheet: Product Performance & Applications

.9 CSA Group (formerly Canadian Standards Association)

.1	B111	Wire Nails, Spikes and Staples (Withdrawn)
.2	A123.22	Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection

.10 ASTM International

.1	A792/A792M	Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process

1.2 Submittals

.1 Samples:

.1 Submit colour swatch of standard colours for Owner selection.

.2 Submit 50 mm x 50 mm samples of each type of material, finish, and colour to be used.

.2 Product Data:

.1 Submit PDF copy of manufacturer's product literature including product specifications and technical data sheets for sheet metal flashing fasteners and accessory materials. Include product characteristics, performance criteria, physical size, finish, and limitations.

.2 Submit product data of button punch tool if use is intended.

1.3 Mock-Up

.1 Assemble on-site mock-up of each condition for Consultant review, including:

.1 **Parapet cap flashing**

.2 **Upturn flashing**

.2 Mock-up shall include all components of system, including typical joints and connection hardware, and typical tie-ins to adjoining systems, finished as specified.

.3 Modify mock-ups as Consultant may direct to meet specified requirements.

.4 Mock-up may remain as part of the Work.

.5 Allow 48 hours for Consultant review of mock-up before proceeding with work.

1.4 Delivery, Storage, and Handling

.1 Do not expose stored products to wetting or damage. Store neatly and properly stacked.

.2 Transport, handle, and store products so as to prevent damage. Stack preformed products in manner to prevent twisting, bending, and rubbing.

.3 Remove units or components that are stained, watermarked, cracked, bent, chipped, scratched, or otherwise unsuitable for installation and replace with new.

.4 Protect finish and edges in accordance with manufacturer's directions.

.5 Store material in accordance with manufacturer's directions.

.6 Prevent contact of dissimilar metals during storage and protect from acids, flux, and other corrosive materials and elements.

2.0 PRODUCTS

2.1 Sheet Metal Materials

.1 Carbon Steel:

.1 Z275 (G90) galvanized steel sheet to ASTM A653/A653M, commercial quality coating.

.1 Thickness: 24 gauge

.2 Finish: Siliconized Polyester

.1 Prefinished steel with factory applied silicone modified polyester on primer, both paint and primer back cured. Include wash coat on reverse side of coil stock to prevent corrosion of backside surfaces.

.2 Dry film coating thickness to CSSBI S8:

.1 Exposed Coat: 0.025 mm ± 0.0025 mm (1.0 mils ± 0.1 mils).

.2 Wash Coat: 0.0125 mm ± 0.0013 mm (0.5 mils ± 0.05 mils).

.3 Specular Gloss: 30 units ± 5 in accordance with ASTM D523.

.4 Product: Perspectra Plus Series

.3 Colour: The Owner will select up to four colours from manufacturer's standard colour range.

2.2 Accessories

.1 Plastic Cement: Cutback asphalt type, to CAN/CGSB 37.5.

.2 Sealants:

.1 Category 1: One part silicone conforming to ASTM C920 Type S, Grade NS, Class 50, Use NT, M, G, A, O.

.1 795 by Dow Corning.

.2 Spectrem 2 by Tremco Ltd.

.2 Colour of Sealants: Selected by the Owner to match adjacent finishes. Contractor to provide colour samples to facilitate selection

.3 Joint Cleaner: Xylol, methylethylketone, alcohol, or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

.3 Fastening: Of same material as sheet metal, corrosion resistant, to CSA B111, flat head roofing nails of length and thickness suitable for metal flashing and trim application.

.4 Washers: Of same material as sheet metal, 1.0 mm thick with rubber packings.

.5 Touch-Up Paint: As recommended by prefinished material manufacturer to restore paint finish in minor cosmetic scratches. Metal with damage to zinc coating must be replaced.

2.3 Fabrication

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA details and specifications.

.2 Form to maximum 2440 mm (8') lengths using one piece for each flashing section. Make allowance for expansion at joints.

.3 Use flat-lock folded seams for joints and splices of thru-cavity flashings. S-lock joints may be used if all flashing surfaces are sloped greater than 3:1.

.4 Use S-lock joints on parapet cap flashings with hidden fasteners. Allow for field bent standing seams minimum 12 mm (1/2”) tall with 45° corner locks on parapet outside/inside corners.

.5 Positively lap flat lock and S-lock seams if parapet is sloped.

.6 Use S-lock seams where parapet cap flashings are accessible to occupants.

.7 Hem exposed edges on underside 12 mm (1/2”); mitre and seal corners with sealant.

.8 Form sections square, true, and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.9 Form metal flashing on a bending brake with shaping trimmed. Perform hand seaming on a bench, as far as practicable, with proper sheet metal working tools. Make angles of bends and folds for interlocking metal with full regard to expansion and contraction to avoid buckling and damage to metal.

.10 Form flashings, copings, and fascia to profiles indicated on Drawings and as required to complement and finish membrane roofing and wall systems.

.11 File down exposed sharp edges.

3.0 EXECUTION

3.1 Examination

.1 Examine surfaces to receive flashings. Notify the Consultant of surfaces that are considered unacceptable to receive work of this Section.

3.2 Preparation

.1 Protect work of other Sections from damage by work of this Section.

3.3 Installation - General

.1 Install sheet metal work in accordance with CRCA standards.

.2 Use concealed fastenings on front (exposed) faces, and exposed fasteners in areas hidden from view.

.3 Provide underlay under sheet metal; secure in place and lap joints 100 mm (4”). Provide self-adhesive membrane to tie into adjacent assemblies.

.4 Counter-flash bituminous flashings at intersections of roof with vertical surfaces and curbs.

.5 Flash joints to fit tight over hook strips.

.6 Use flat-lock joints for metal flashing except roof. S-pocket and standing seams are acceptable. Lock end joints and caulk with sealant.

.7 Parapet (Coping) Flashings: Use S-pocket (S-lock) seams throughout with overlapped standing seam at corners. Secure standing seam with button punch or rivet.

.8 Birdsmouth Terminations: Install surface mounted reglets true and level, and caulk top of birdsmouth with compatible sealant.

.9 Where flashing installed with mechanical fasteners, install fasteners in slotted or oversize holes to allow expansion and contraction of flashings.

.10 Provide isolation coating or impervious self-adhesive membrane to separate aluminum items from concrete and masonry.

3.4 Counter Flashings

.1 Install metal counter flashings as soon as possible after membrane flashings are in place and reviewed by Consultant.

.2 Counter flashing shall have crimped bottom edge, stiffening break, and as detailed on Drawings and extend down to horizontal plane of roof surface.

.3 Where detailed on Drawings, turn top edge of flashing into walls, secure with lead wedge or friction fit pins into reglet, and caulk at joint to wall.

.4 Secure sections in S-pocket joints and allow sufficient tolerance for expansion and contraction between each piece.

.5 Secure metal counter flashing minimum 300 mm (12”) above roof membrane. Use fasteners of sufficient length to penetrate at least 25 mm (1”) into substrate.

3.5 Cap Flashings

.1 Supply and install continuous metal starter strips, secure at 150 mm o.c. (6” o.c.), maximum of 50 mm above drip edge, with fastener of sufficient length to penetrate minimum 25 mm (1”) into substrate.

.2 Form cap flashings to profiles shown on Drawings and provide positive drainage to interior roof surface areas.

3.6 Touch-Up and Cleaning

.1 Remove grime and dirt from flashing materials by dry wiping as material is erected.

.2 Remove excess solder. Remove excess sealant with sealant manufacturer recommended solvent that will not harm finish.

.3 Wipe off handprints, smudges, and other superficial stains.

.4 Remove and replace dented and damaged materials.

END OF SECTION

1.0 GENERAL

1.1 Work Included

.1 Provide all labour, materials, and equipment necessary for the complete supply, surface preparation, and application of paint required to restore original finishes.

.2 The work of this section shall include, but shall not necessarily be limited to, the following:

.1 Surface preparation, priming, and painting items under other Sections specified as shop primed and surface treated.

1.2 Reference Standards

.1 All referenced Standards are latest editions referenced by the Building Code in the Place of the Work, or latest editions if not referenced by Code.

.2 2024 Ontario Building Code

.3 New Surfaces: Canadian Painting Contractor's Architectural (CPCA) Painting Specifications Manual

.4 Existing Surfaces: Master Painters Institute (MPI) Maintenance Repainting Manual

1.3 Submittals

.1 Make submittals in accordance with Section 01 33 00.

.2 Before any work is commenced, submit sample panels (24" x 36") of each paint type and colour, specified in colour schedule, for Owner's review.

1.4 Quality Assurance

.1 Qualification of Applicators: Contractor shall have a minimum five years of proven satisfactory experience and shall maintain a qualified crew of painters throughout duration of the work who are qualified to fully satisfy the requirements of this Specification. Only qualified workers with a "Red Seal" qualification or an apprentice working under the same shall be engaged in painting and decorating work.

.2 Conform to standards contained in MPI Manual, latest edition.

.3 All paint manufacturers and products shall be as listed under “Approved Products” section of MPI Manual.

.4 All painting, unless otherwise specified, shall be to MPI Manual - Premium Grade.

1.5 Delivery, Storage, and Handling

.1 Delivery, storage, and handling of materials shall be in accordance with applicable sections of MPI Architectural Painting Specification Manual. Deliver and store on site in manufacturer’s sealed and labelled containers. Protect latex materials from freezing. Maintain stored materials at a temperature of 8°C or more.

.2 Take all necessary precautionary measures to prevent fire hazards and spontaneous combustion.

1.6 Protection

.1 Adequately protect all other surfaces from paint and damage and make good any damage caused by failure to provide suitable protection.

.2 Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or droppings from fouling surfaces not being painted, including surfaces within the storage and preparation area.

.3 Mask all surfaces not being painted to obtain uniform termination.

.4 Remove all electrical plates, surface hardware, fittings, and fastenings prior to painting operations. Carefully store, clean, and replace upon completion of Work in each area.

1.7 Environmental Conditions

.1 Temperature and moisture content of all surfaces shall conform to ratings given in CPCA or MPDA manual.

.2 All areas where painting and decorating work are proceeding require adequate continuous ventilation and sufficient heating facilities to maintain temperature above 10°C for 24 hours before, during, and 24 hours after paint application.

.3 Do not paint where there is dust in the air.

.4 Provide adequate illumination on surfaces being painted.

1.8 Maintenance Materials

.1 At project completion, provide 16 L (4 gal.) of each type of colour to paint from same production run (batch mix) used, in unopened cans, properly labelled and identified for Owner's later use in maintenance. Store where directed.

2.0 PRODUCTS

2.1 Materials

.1 Use paint materials and products of paint manufacturers listed and approved in MPI Manual and CGSB Qualified Products List. No substitutions.

.2 All paints shall be Premium Grade; first quality products as manufactured by C.I.L., Bapco Paint Co., Brandram-Henderson Company, Sherwin Williams, Glidden, Pratt & Lambert, Benjamin Moore, and General Paint.

.3 Provide undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer and use only within recommended limits.

.4 Exterior Painting and Finishing Schedule

.1 Unless otherwise indicated, titles and code numbers in below listed schedule refer to MPI Architectural Painting Specification Manual, Chapter 2, for type surfaces, coating, grade, named products, and their manufacturers. Use products from only one manufacturer for each system.

.2 Schedule:

.1 Concrete Horizontal and Vertical Surfaces: REX 3.1A-Latex-DSD2.

.2 Steel and Metal Fabrications: REX 5.1D-Alkyd-DSD2.

.3 Galvanized Metal: REX 5.3D-Alkyd-DSD2.

2.2 Mixing

.1 Paints shall be ready-mixed unless otherwise specified. Paint shall have good flowing and brushing properties and shall dry or cure free of streaks or sags to yield the desired finish specified.

3.0 EXECUTION

3.1 Inspection

.1 Examine all surfaces to be painted before commencing work.

.2 Commencement of work indicates acceptance of surfaces and job conditions.

3.2 Preparation of Surface

.1 Prepare surfaces in accordance with MPI Manual.

.2 Prepare existing exterior surfaces by high-pressure water or other approved method to remove all dust, loose paint, and other deposits on surfaces.

.3 Remove hardware, hardware accessories, machines surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.

.4 Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly painted surfaces.

3.3 Application

.1 Perform painting and decorating work in accordance with the standards and requirements incorporated in the CPCA Manual and/or MPI Manual.

.2 Method of paint application shall be by either spray-on or roll-on, sufficient to fill all voids in existing surfaces and provide uniform appearance.

.3 Apply primer and two coats of approved paint to exposed surfaces of all repaired drywall or masonry surfaces, maximum coverage rate of 250 sq. ft. per imperial gallon per finish coat.

.4 Apply two coats of approved paint to all miscellaneous metal fabrications, maximum coverage rate 150 sq. ft. per imperial gallon per coat.

.5 Flammable rubbish, cotton waste, cloths, and material that may constitute a fire hazard shall be placed in closed metal containers and removed from site daily.

.6 Protect all signs and fixtures attached to the walls. Uncover and clean when painting has been completed.

.7 Parking stall numbers to be painted black using stencil to match existing numbers.

END OF SECTION

1.0 GENERAL

1.1 Work Included

.1 This Section outlines repair and inspection procedures to be undertaken when existing electrical conduits, fixtures, etc. are damaged due to the construction activity.

.2 Damaged electrical conduits, fixtures, etc. must be repaired in a timely fashion. If repair cannot be made in a timely fashion, a temporary system must be installed.

.3 Visit site to ascertain and note existing conditions that will affect the Work.

1.2 Regulatory Requirements

.1 Comply with Safety Codes Act and rules and regulations made pursuant thereto, including Canadian Electrical Code.

.2 Unless otherwise indicated, all references in the Contract Documents to "Canadian Electrical Code" or "CEC" shall mean the edition of the Canadian Electrical Code, Part I, CSA C22.1 and the variations made thereto by Ontario regulation, which are in force on the date of bid closing for the Contract.

.3 All electrical products shall be tested, certified, and labelled in accordance with a certification program accredited by the Standards Council of Canada.

.4 Submit drawings and specifications to authority having jurisdiction and local utility company for examination and approval before commencement of electrical work. Pay any associated fees required to obtain a permit for the Work.

.5 Submit a copy of electrical permit obtained from the Authority Having Jurisdiction to the Consultant.

1.3 Examination of Site

.1 Visit and examine the site and all applicable Drawings before Bid. The Bid shall include all costs for required electrical work necessary for performance of the Work. No extras will be paid due to failure to visit the site or adequately review all required interfacing details.

1.4 Delivery, Storage, and Handling

.1 Submit copies of Safety Data Sheets (SDS) for all products prior to arrival on site.

.2 Deliver, store, and maintain packaged material with manufacturer's seals and labels intact.

.3 Store material in regulation containers in accordance with the Occupational Health and Safety Act and manufacturer instructions.

.4 Toxic or hazardous chemicals shall be secured in a locked storage area with appropriate protection measures in accordance with the Occupational Health and Safety Act.

.5 All containers to be labelled with material expiration dates. Material that is older than the expiry date shall be rejected. Shelf life shall be strictly adhered to and material shipped without dates will be rejected. Immediately remove rejected materials from site.

2.0 PRODUCTS

2.1 Materials

.1 Use new products unless otherwise specified.

.2 Provide electronic copies of maintenance instructions for finished surfaces and maintenance material before Substantial Performance of the Work.

3.0 EXECUTION

3.1 Exposed Conduits, Fixtures, Etc.

.1 All exposed conduits and fixtures are to be properly protected and operational at all times during the Work. Refer to Section 01 56 00.

.2 Repair or replacement of damaged exposed conduits, cables, and fixtures is Contractor's responsibility when damage was caused by Contractor's operations. Required repair or replacement work to exposed conduits, fixtures, etc. may be performed by Contractor's own electrician.

3.2 Existing Embedded Electrical Services

.1 Identify potential areas of buried or hidden conduit, and locate or switch off high voltage systems in the area of Work to prevent possible damage and injury. Coordinate requirements with Owner.

.2 Take utmost precaution during demolition operations to prevent damage to buried or hidden conduit and cables. Immediately report damage to hidden conduits, cables, and systems to Owner and Consultant.

.3 Damaged or deteriorated conduits are not to be covered up without specific approval from Owner.

.4 Allow reasonable time in scheduling of the Work for implementation of any required repairs to buried or hidden conduit, cables, and systems.

.5 Take all precautions to ensure embedded conduits uncovered by the work are not live before performing demolition work around them. Anticipate uncovering lighting conduits, 600V main power lines, exhaust fan conduits, alarm lines, telephone lines, etc.

.6 Repair or abandon damaged conduit, cabling, and systems uncovered by the Work at discretion of Owner. Owner will pay for repairs to damaged hidden conduit, cabling, and systems, provided damage did not result from a lack of Contractor care or negligence. Negligence shall be determined at discretion of Consultant.

.7 All repairs to embedded electrical conduit, cabling, and services will be performed by an electrician that is agreeable to Owner and paid via Change Order through contingency allowance.

3.3 Temporary Systems

.1 If damage to surface-mounted or hidden conduit, cabling, and systems cannot be repaired in a timely fashion, Owner may, at their discretion, request that Contractor provide a temporary system or connection to maintain operation.

.2 Costs for requested temporary systems will be allocated to Owner for damage to hidden conduit, cabling, and systems and to Contractor for damage to surface mounted conduit, cabling, and systems.

3.4 Inspection of Work

.1 All electrical system repair work is to be inspected by the Electrical Safety Authority (ESA)..

.2 Arrange for required inspections of repairs within 48 hours of repairing damage. Schedule all required inspections, regardless of whether Owner's or Contractor's electrician performed the repair.

.3 Cost of inspections shall be responsibility of Contractor.

.4 Copies of inspection certificates for required inspections shall be distributed to Owner and Consultant upon completing the Project.

END OF SECTION