





# SPECIFICATION FOR REPLACEMENT OF ROOFING, CHILLER & COOLING TOWER AT ST. LAWRENCE COMMUNITY CENTRE 230 THE ESPLANADE, TORONTO, ON, M5A 4J6

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February 26, 2025

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### 1 General

### 1.1 General Notes:

- .1 It is intended that Work supplied under the Contract Documents shall be complete and fully operational in every detail for the purpose required. Provide all items, articles, materials, services and incidentals, whether or not expressly specified or shown on the Contract Drawings, to make finished Work complete and fully operational, consistent with the intent of the Contract Documents.
- .2 All work shall be completed in accordance with the requirements of the authority having jurisdiction.
- .3 The Owner and/or authorized persons, may at any time enter upon the work and premises used by the Contractor for the purpose of operating the facility or for inspections of the Contractor's Work.
- .4 The Contractor shall check all site dimensions prior to fabrication of any materials and construction.
- .5 Existing construction shown has been taken from available information. When specific details are unavailable, assumptions have been made regarding probable construction. Any variance from construction, as Shown on the Contract Drawings shall be immediately brought to the attention to the Owner/Consultant.
- .6 Where applicable, the Contractor shall relocate all disturbed electrical fitments, outlets, telephone outlets, etc. and mechanical equipment, as necessary to modify existing surfaces to provide for the work as indicated on the Contract Drawings. The Contractor shall provide new enclosures, as required.
- .7 Where applicable, fill all holes left from mechanical and electrical services removed or relocated to maintain the required fire separations and to maintain the intended finished appearance of the surface The work must be performed by skilled and competent trades people licensed to work in the Province of Ontario for the particular trade work they are providing. All work must be performed in compliance with the Provincial and Local Building Codes, and regulations.
- .8 Co-operate with the City Representative in allocation of mobilization areas of site for field offices and sheds, for access, traffic, and parking facilities.

- .9 Notify owner 48 hours in advance of noise-generating activities, interruption of any building services. Do not interrupt building services without owner's permission. Perform extreme noise generating work after hours. Obtain approval from Owner for after hours time schedule.
- .10 Comply with instructions of the Owner for use of temporary utilities and construction facilities.
- .11 Attend the final inspection and make-good deficiencies identified by the Consultant and Owner.
- .12 Where deficiencies are reported by the Consultant, submit a written proposal for the repair of the deficiency. All testing required shall be paid for by the Contractor.
- .13 The Consultant and Owner have authority to stop the work if there is an emergency.
- .14 Submit in writing, requests for Contract variation, at least 10 days in advance. This includes material substitution, and changes in repair methodology. The Consultant reserves the right to reject the substitutions and variations. Do not proceed with any changes to the Contract without approval from the Consultant, and written approval from the Owner.
- .15 No areas of work are to be covered or concealed until they have been reviewed and approved by the Consultant.

# **1.2 Existing Site Conditions:**

- .1 Make careful examination of the site, and investigate and be satisfied as to all matters relating to the nature of the Work to be undertaken.
- .2 Report any inconsistencies, discrepancies, omissions and errors between site conditions and Contract Documents to the owner prior to the commencement of Work. Ensure that each Subcontractor performing work related to the site conditions has examined it so that all are fully informed on all particulars which affect the Work thereon in order that construction proceeds competently and expeditiously.

# **1.3 Removal and Replacement of Existing Items:**

.1 All materials that are required to be removed and reinstalled shall be reinstalled in an undamaged condition.



.2 If any materials or equipment specified to be salvaged and reused are damaged by the Contractor, the Contractor shall dispose of the damaged items and replace with new materials or equipment of equal or better quality.

### 1.4 Supervision and Maintenance of Documents on site

- .1 The Contractor shall provide all superintendence, labour, equipment, and materials necessary to complete the project in an orderly, competent, and expeditious manner.
- .2 While work is in progress, the Contractor must maintain site superintendence capable of acting competently on site instructions given by the Owner.
- .3 A copy of all specifications, drawings, written instructions, MSDS, approved shop drawings, Health & Safety policy, Certificate of Recognition (COR) audits and changes in work shall be kept on site and shall be available as required.

### 1.5 Non-conforming and Defective Work:

- .1 The Owner/Consultant will inspect the work periodically to determine if the work has been completed in accordance with good workmanship practices. If the products or work is not acceptable due to their condition, noncompliance, if omissions have occurred, or other deficiencies exist, whether the defective work has been incorporated into the work or not, the owner shall reserve the right to:
  - .1 Direct the Contractor to correct the defective work or non-conforming work within a timetable established by the Owner.
  - .2 Should the Contractor fail to correct the deficiencies within a time frame established by the Owner, and the Owner has determined that the Contractor has not complied with the time table in correcting the defective work or if the work has not be performed in accordance with the contract documents , or authorities having jurisdiction then the Owner may deduct from the amount otherwise due to the Contractor the difference in the value between the work performed and that called for by the Contract documents. The Owner's decision in this matter will be final.
  - .3 Correction of all non-conforming/defective work or work not in conformance with all applicable Local, Provincial and Federal Codes and Standards shall be at the expense of the Contractor.

### **1.6** Security and Protection of Construction Site and Equipment

- .1 Protect the construction site and equipment from damage. Repair any damage to the construction site or equipment to the satisfaction of the Owner.
- .2 Take precautions to protect the site and equipment until final completion.
- .3 The Owner shall not be responsible for damaged, lost or stolen materials and equipment. The Contractor is responsible for all materials and equipment left on site until the work is complete. The Contractor must provide for proper security or storage of any material or equipment left on site.
- .4 During off construction hours the Contractor must ensure that the work area is secured, and that all tools and materials are locked up.

### **1.7 Protection of Existing Facility and Personnel**

- .1 Do not endanger in any way the personnel, equipment, offices and existing structures of the Owner. Exercise caution to keep the existing facilities free from damage due to the Contractor's work. If the measures observed by the Contractor are not considered sufficient, the Owner may order additional precautions to be taken.
- .2 The buildings and parking areas, which are not immediately affected by the Work, will remain occupied during the Work.
- .3 Take all necessary precautions to adequately protect the building and property from damage. Make good all damage caused by the Contractor's operations at no extra cost.
- .4 Erect suitable safety barriers as required for security and to make the site safe for pedestrians.
- .5 Supply and erect temporary hoarding and barricades where required. Provide a temporary hoarding plan.
- .6 Remove the barriers from the site at the completion of the work or when directed by the Owner.
- .7 Protect the Work at all stages, and maintain the protection until the Work is completed. Remove and replace any work and materials damaged, that cannot be satisfactorily repaired, at no extra cost.



### **1.8 Protection of Existing Utilities**

- .1 The Contractor shall be responsible for the protection of all utilities at the job site for the duration of the work.
- .2 Removal, relocation, or supporting of existing utilities shall be carried out in consultation with the respective authorities: Bell Canada, Municipality of Toronto, Veridian, Hydro One Connections, Enbridge Gas, Rogers Cable or any other utility/contractor as required. The contractor will be responsible to co-ordinate the removal and re-installation of equipment/cable.
- .3 The Contractor shall pay any charges for repairs and lost revenue if utility equipment, cables, pipes or other assets are damaged and be responsible to make good any ground and surface damages.
- .4 The Contractor shall verify that services are cut off, capped, diverted and/or removed as required by local regulating authorities. It is the Contractor's responsibility to ensure all services are in the proper state prior to commencing work.

### **1.9 After-hours or Emergency Services**

.1 The Contractor shall provide an after-hours contact and phone number to respond to emergencies or requirements that arise when offices are closed.

### **1.10 Delivery Requirements**

- .1 The Contractor shall fully indemnify the Owner for all damages to persons or property resulting from the services and operations performed by its employees (and contracted agents or carriers) including the delivery and unloading of goods or equipment at construction premises.
- .2 Delivery vehicles shall be suitably licensed, insured, operated and maintained in accordance with the Contract requirements, the Contractor's (and its agent's or carrier's) applicable policies and procedures, and all applicable federal, provincial and municipal legislation, statutes and by-laws.

### 2 Products-not used

### 3 Execution - not used

### End of Section

### 1 General

### 1.1 Section Includes

- .1 Documents and terminology.
- .2 Associated requirements.
- .3 Work expectations.
- .4 Work by other parties.
- .5 Premises usage.

### **1.2 Related Requirements**

- .1 Section 01 21 00 Cash Allowances
- .2 Section 01 32 00 Construction Progress Documentation
- .3 Section 01 78 00 Closeout Submittals

### 1.3 References – words, terms and definitions

.1 Refer to and acknowledge other words, terms, and definitions in City of Toronto Construction Agreement and Contract terms.

### **1.4 Complementary Documents**

- .1 Drawings, Specifications, and schedules are complementary each to the other and what is called for by one to be binding as if called for by all. Should any discrepancy appear between documents which leave doubt as to the intent or meaning, abide by Precedence of Documents article below or obtain direction from the Consultant.
- .2 Drawings indicate general location and route of conduit and wire/conductors. Install conduit or wiring/conductors and plumbing piping not shown or indicated diagrammatically in schematic or riser diagrams to provide an operational assembly or system.
- .3 Install components to physically conserve headroom, to minimize furring spaces, or obstructions.
- .4 Locate devices with primary regard for convenience of operation and usage.

### Summary of Work

# Section 01 11 00 St. Lawrence Community Centre

.5 Examine all discipline Drawings, Specifications, and schedules and related Work to ensure that Work can be satisfactorily executed. Conflicts or additional work beyond work described to be brought to attention of Consultant

# **1.5 Description of the Work**

- .1 Mobilization/Demobilization:
  - .1 Mobilization/Demobilization of personnel and equipment on site. This includes those items listed below and will also include the reinstatement of sod, concrete pavers, trees, plants or any landscaping damaged by the Contractor in case used for storage or other, and include cleaning of all debris and remove of debris from the site.
  - .2 Barricade the work area, protect the adjacent areas and provide all temporary shoring necessary for all stages of this project. Provide hoarding, safety fencing, safety signage, caution tape, during construction, to ensure site is secure and safe at all times. Provide means of dust protection to keep occupied interior areas free from dust.
  - .3 Temporarily disconnect and cap all service/utilities lines which are connected to the construction areas. It is contractor's responsibility to locate all existing service/utility lines within and embedded in the proposed work areas. Access to the building must be maintained at all times during the project. Verify all dimensions on site. Provide for all safety measures on site to meet current OHSA standards.
  - .4 All permits except building permit, shall be obtained and paid by the Contractor, including but is not limited to street permit for parking of Contractor's vehicle and storage shall be obtained and paid by the Contractors. Arrange garbage disposal during construction. Upon completion of work, demobilize all equipment, and clean up work site and dispose of all waste.
- .2 Demolition and Disposal (Concrete work & steel work):
  - .1 Demolition work include but is not limited to: demolition, removal and disposal of demolished debris of concrete and steel beams and associated items and all demolished items stated in each section herein this specification.
- .3 Concrete Repairs (soffit repairs & top surface repairs):

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- .1 Saw cut, chip and remove deteriorated concrete. Sandblast and clean existing rebars. Form, pour concrete and cure.
- .4 Crack Repairs:
  - .1 Rout and clean cracks. Prime and install bond breakers, tape and seal.
- .5 Roofing scope of work
  - .1 This section includes labour, material, equipment, tools and supervision necessary for replacement of roofs A, B, C, E, F, G at 230 The Esplanade, Toronto, Ontario.
    - .1 Remove the existing roof down to the deck and discard. Keep for reuse existing insulation and ballast. Prime the deck with asphalt primer. Raise the perimeter with three layers of wood blocking and install a new wood shim. Torch apply a modified base sheet membrane to the deck. Install modified peel and stick flashing. Torch apply a modified cap sheet and cap sheet flashing. Install a layer of 6 mil polyethylene sheet. Allow to replace approximately 20% of the insulation. Install insulation loose laid over the polyethylene sheet. Install a secondary layer of insulation 2.0 in. polystyrene IV insulation over the complete roof except roof A. On roof A install a secondary layer of 1.0 in. polystyrene IV insulation. Install a filter fabric sheet. Install ballast back in place. Install 24 gauge sheet metal flashing. Install new soil vent flashing. Install new drain inserts with U flow seals. Supply and install all sealant. Allow to replace all concrete pavers on roof A. Allow to replace approximately one hundred and twelve (112) concrete pavers on insulation padding. Install new door seals at door to roof. Supply and install a new metal ladder from the main roof to roof D. Install safety railing at the perimeter of roof A. Install a new safety railing around the roof hatch. Applicable to roof A - 4,148 sg. ft., B - 1,144sq. ft. ,C – 110 sq. ft., E- 246 sq. ft., F – 501 sq. ft., G – 2,714 sq. ft.
  - .2 This section includes labour, material, equipment, tools and supervision necessary for replacement of roof D at 230 The Esplanade, Toronto, Ontario.

Remove the existing roof down to the deck and discard. Mechanically fasten a layer of 0.5 in. Dens Deck Prime over the deck. Prime the board with asphalt primer. Raise the perimeter with

### Summary of Work

# Section 01 11 00 St. Lawrence Community Centre

three layers of wood blocking and shim. Torch apply a modified base sheet membrane. Install modified peel and stick flashing. Torch apply a modified cap sheet and cap sheet flashing. Install a layer of 4.0 in. base insulation. Install a secondary layer of 2.0 in. polystyrene IV insulation. Install a filter fabric sheet. Install ballast back in place. Install 24 gauge sheet metal flashing. Install new safety railings for the ladder. Install new hot B vent stack flashing and soil vent flashing. Install all sealant. Install concrete pavers at the ladder. Applicable to roof D – 1,261 sq. ft.

- .6 Mechanical scope of work:
  - .1 Refer to mechanical drawings for mechanical specifications.
- .7 Electrical scope of work
  - .1 Refer to electrical drawings for electrical specifications.
- .8 Division of the Work among Subcontractors, suppliers and vendors is solely the Contractor's responsibility. Neither the Owner nor Consultant assumes any responsibility to act as an arbiter to establish subcontract terms between sectors or disciplines of work.
- .9 Refer to the Drawings and Specifications for the required Work.
- .10 Division 01 General Requirements, of the Specification generally specify work and coordination of the work that is the direct responsibility of the Contractor but shall not be interpreted to define absolutely the limits of responsibility that must be established between the Contractor and their Subcontractors by their separate agreements.
- .11 Ensure that Subcontractors understand that the General Conditions of the Contract as amended by the Supplementary Conditions, and Division 01 General Requirements, apply to Sections of the Specification governing their work.
- .12 Ensure that the work includes all labour, equipment and products required, necessary or normally recognized as necessary for the proper and complete execution of the work of each trade.
- .13 The Work also includes the examination of the site, submission of samples, scheduling and coordination, project meetings, protection of the existing facility, repair and preparation of surfaces, quality control, inspection reports, project cleanliness, maintenance of data, preparation of as-built drawings, final cleaning and warranty.

### **1.6 Discrepancies and Clarifications**

- .1 Advise Consultant of discrepancies discovered in requirements of the Contract Documents and request clarification from Consultant in written form.
- .2 Advise Consultant when clarifications are required pertaining to meaning or intent of requirements of Contract Documents and request clarification from Consultant in written form.
- .3 Do not proceed with related work until written clarification is provided by Consultant.
- .4 Failure to notify Consultant shall result in Contractor incurring responsibility for resulting deficiencies and expense at no additional cost to the Owner.
- .5 Written instructions issued by Consultant for clarification, implicitly supersede applicable and relevant aspects of the Contract Documents irrespective of whether these documents are explicitly or specifically cited in clarification requests or clarification instructions.
- .6 Failure to notify Consultant shall result in Contractor incurring responsibility for resulting deficiencies and expense at no additional cost to the Owner.
- .7 Written instructions issued by Consultant for clarification, implicitly supersede applicable and relevant aspects of the Contract Documents irrespective of whether these documents are explicitly or specifically cited in clarification requests or clarification instructions.
- .8 Salvage and reuse all site furnishings and fixtures which are identified to be relocated on the site. The Consultant shall approve condition of all salvaged site furnishings and fixtures.

### 2 Products - not used

3 Execution - not used

# **End of Section**

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### 1 General

### **1.1 Section includes**

- .1 Owner access.
- .2 Contractor's use of site.
- .3 Connecting to existing services.
- .4 Site access.
- .5 Continuity of existing service.
- .6 Working hours.
- .7 Special scheduling requirements.

### 1.2 Related requirements

- .1 Section 01 32 00 Construction Progress Documentation
- .2 Section 01 33 00 Submittal Procedures.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 07.

### 1.3 Owner access

- .1 The building areas, which are not immediately affected by the Work, will remain occupied by the Owner during the Work.
- .2 Ensure adequate access to areas not occupied for the Work.

### 1.4 Contractor's use of site

- .1 Accept full responsibility of assigned work and storage areas from the time of Contract award until completion of the Work.
- .2 Facility shall remain operational throughout the project so the Contractors work must not interfere with the facility operations.
- .3 Do not unreasonably encumber site with materials or equipment.
- .4 Do not obstruct entrances, stairs or fire exits.
- .5 Do not prop open any doors.
- .6 Maintain free access route for emergency vehicles, waste disposal trucks and delivery vehicles.
- .7 Provide for all vehicular and pedestrian traffic.

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# Work Restrictions

- .8 The placement of a refuse bin will be allowed in an area agreed by the Owner.
- .9 Repair all damage to paving, grass, walkways, curbs, trees, planting beds, and any other areas, caused by the Contractor's operations.

### 1.5 Existing services

- .1 Notify Owner and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Owner, minimum forty-eight (48) hours of notice for necessary interruption of mechanical or electrical service throughout course of work.
- .3 Keep duration of interruptions minimum.
- .4 Perform interruptions after normal working hours of occupants, preferably on weekends.

### **1.6** Site access by Contractor

- .1 Unless stated otherwise, the Contractor will be permitted access to the site from start of construction until Substantial Performance of the Contract.
- .2 No Parking space available on site for the Contractor.
- .3 Access Roads and Walks:
  - .1 All construction vehicles and personnel required for construction shall use existing access roads and walks as determined at later date by Owner. When no longer required, or at completion of Work, make good all disturbed surfaces. Maintain roads and walks, removing dirt, mud, debris, ice, snow and other obstructions during use.
  - .2 Provide for access of emergency vehicles at all times.
- .4 After Substantial Performance of the Contract, the Contractor shall not enter the facility without prior written authorization from the Owner and the Contractor's activities shall be restricted to the work duly authorized by the Owner, including modifications and rectification of deficiencies. If the Contractor proposes to perform additional work other than the authorized work, further written approval must be obtained by the Contractor from the Owner prior to proceeding with such additional work.
- .5 Workers employed on the site shall sign a "Daily Register" provided showing "IN" and "OUT" times and number of hours worked on each shift. Times shall be recorded in 24-hour time (i.e. 00:00 to 23:59).



# 1.7 Continuity of existing service

- .1 Operation of existing building shall take precedence over Contractor's operations. Keep existing buildings (community centre and daycare) in operation at all times.
- .2 Arrange Work so that services to the existing buildings will not be unduly interrupted at any time. The time duration for an interruption must be kept to a minimum and must be arranged with the Owner's Project Manager and Owner's representative at the place of the work.
- .3 Provide at least forty-eight (48) hours' advanced notice for all required interruptions to utility, heating, cooling, mechanical, electrical and life safety systems.

### 1.8 Working hours

- .1 Carry out Work Monday through Friday except statutory holidays during Contractor set regular hours.
- .2 If the Contractor wishes to complete any work outside of these regular hours, obtain permission from the Owner's Project Manager at least forty-eight (48) hours prior.
- .3 The Owner will not be responsible for additional costs associated with working after regular hours unless such after-hours work is ordered by the Owner and not specified as a requirement in the Contract Documents.
- .4 The Owner will not be responsible for additional costs associated with working after regular hours if such after-hours work is required for the Contractor to return to the agreed upon construction schedule.

# 1.9 Special requirements

- .1 Noise generating work shall be performed in conformance with City of Toronto's noise by-law.
- .2 Submit schedule of special requirements or disruptions in accordance with Section 01 33 00.



**Work Restrictions** 

2 Products – not used

3 Execution – not used

### End of section



### 1 General

### **1.2 Section includes**

.1 Cash allowances.

#### 1.3 Cash allowances

- .1 Inspection and testing allowances shall include:
  - .1 Net cost of inspection and testing services
  - .2 Applicable taxes and duties, excluding HST
- .2 Include cash allowances in the Contract Price. Differences in costs will be adjusted by Change Order.

#### 1.4 Use of cash allowances

- .1 Expenditures against cash allowance will be made only upon receipt of written authority from the Owner.
- .2 No expenditure against a cash allowance shall be made or incurred except as instructed by the Owner in writing.
- .3 Submit copies of all invoices for labour, materials and equipment to the Owner to substantiate charges against the allowances.
- .4 Any unused portion of cash allowances will be credited to the Owner upon completion of the Work.
- .5 The cash allowances do not include Harmonized Sales Tax (HST)

### 2 **Products – not used**

#### 3 Execution – not used

### End of section

### 1 General

### **1.1 Section includes**

- .1 This Section includes administrative provisions for coordinating construction operations including, but not limited to, the following:
  - .1 General project coordination procedures
  - .2 Coordination of Drawings
  - .3 Administrative and supervisory personnel
- .2 Each Subcontractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to specific Subcontractors by Contractor.

### 1.2 Related requirements

- .1 Section 01 32 00 Construction progress documentation
- .2 Section 01 33 00 Submittal procedures
- .3 Section 01 45 00 Quality control
- .4 Section 01 78 00 Closeout submittals
- .5 This section describes requirements applicable to all Sections within Divisions 02 to 07.

### **1.3 Existing Site Conditions**

- .1 Existing construction shown has been taken from available information. When specific details are unavailable, assumptions have been made regarding probable construction. Any variance from construction, as shown on the Drawings shall be immediately brought to the attention to the Owner and Consultant.
- .2 Make careful examination of the site and investigate and be satisfied as to all matters relating to the nature of the Work to be undertaken.
- .3 Check all site dimensions prior to fabrication of materials and construction.
- .4 Report any inconsistencies, discrepancies, omissions and errors between site conditions and Contract Documents to the Consultant prior to the commencement of Work.
- .5 Ensure that each Subcontractor performing work related to the site conditions has examined the site so that all are fully informed on anything which may

# Project Management and Co-ordination Section 01 31 00 St. Lawrence Community Centre

affect their Work thereon in order that construction proceeds competently and expeditiously.

### 1.4 Coordination

- .1 Cooperate with the Owner's representatives at the Place of the Work to minimize disruptions to the building operation and services.
- .2 Coordinate with the Owner's representative regarding access and use of site.
- .3 Coordinate performance and sequencing of the Work with the Owner.

### 1.5 Submittals

.1 Provide submittals in accordance with Section 01 33 00.

### 1.6 Dimensions

- .1 Do not scale directly from Drawings. Obtain clarification from the Consultant if there is ambiguity or lack of information.
- .2 Details and measurements of any Work which is to fit or to conform with Work installed shall be taken at the Place of the Work.
- .3 Verify dimensions at the Place of the Work before commencing Shop Drawings or other submittals. Before fabrication commences report discrepancies to the Consultant in writing. Incorporate accepted variances on Shop Drawings and as-built records.
- .4 In areas where equipment is scheduled to be installed, check dimensional data on equipment to ensure that the area and equipment, including future known equipment are compatible with necessary access and clearances provided. Equipment supplied shall be dimensionally suitable for space allocation.
- .5 Verify that the Work is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent Work, as set out in accordance with the requirements of the Contract Documents and ensure that Work installed in error is rectified at Contractor's expense before construction continues.
- .6 Owner will accept no claims for extra expense on the part of the Contractor for non-compliance.



### **1.7 Supervision of the Work**

- .1 Provide all superintendence, labour, equipment, and materials necessary to complete the project in an orderly, competent, and expeditious manner.
- .2 While work is in progress, maintain site superintendence capable of acting competently on-site instructions given by the Owner.
- .3 Maintain good order and discipline among workers engaged on the project.

### **1.8 Maintenance of documents on site**

- .1 Maintain at the job site, one copy of each of following:
  - .1 Drawings
  - .2 Specifications
  - .3 Addenda
  - .4 Change Orders and Change Directives
  - .5 Shop Drawings and samples
  - .6 Other modifications to the Contract
  - .7 Site instructions
  - .8 Copy of approved work schedule
  - .9 Copy of manufacturer's installation instructions
  - .10 SDS sheets
  - .11 Contractor's health and safety policy
  - .12 Ministry of Labour Notice of Project
- .2 Maintain documents in a clean, dry, legible condition and make documents available at all times for inspection by the Owner

### **1.9** Security and protection of construction site and equipment

- .1 Protect the construction site and equipment from damage. Repair any damage to the construction site or equipment to the satisfaction of the Owner.
- .2 Take precautions to protect the site and equipment until Completion.
- .3 The Owner shall not be responsible for damaged, lost or stolen materials and equipment. Contractor is responsible for all materials and equipment left on site until the work is complete. Provide for proper security or storage of any material or equipment left on site.

# Project Management and Co-ordination Section 01 31 00 St. Lawrence Community Centre

.4 When not at the Place of the Work, ensure that the work area is secured, and that all tools and materials are locked up.

### 1.10 Existing utilities

- .1 Protect all utilities at the Place of the Work for the duration of the work.
- .2 Maintain all existing services including power and data to the entire building and occupied areas of the suites used by the Owner. Any and all shutdowns or disruptions in service are to be approved by the Owner.
- .3 Have all utilities located and staked out and provide the Owner/Consultant with all cable locations supplied by the utilities. Obtain Consultant's written approval to commence any excavation or demolition.
- .4 Contact the local municipality, utilities or any other agencies for further information regarding the exact location of all existing utilities, to exercise the necessary care in excavation and demolition operations, and to take such precautions necessary to safeguard the utilities from damage.
- .5 All utilities located within the limits of proposed excavations shall be exposed by hand excavation and carefully supported and protected by the Contractor.
- .6 Removal, relocation, or supporting of existing utilities shall be carried out in consultation with the respective authorities:
  - .1 Bell Canada
  - .2 Hydro One Connections
  - .3 Enbridge Gas
  - .4 Rogers Cable
  - .5 any other utility/contractor as required.
- .7 Be responsible for paying charges by the Utilities or Agencies for locating cables and the Contractor shall pay any charges for repairs and lost revenue if utility equipment, cables, pipes or other assets are damaged and is responsible to make good any ground and surface damages as well.
- .8 Prior to the commencement of demolition, provide a sign-off sheet from the existing water, gas, electrical, telephone, and sewer service providers.
- .9 Verify that services are cut off, capped, diverted and/or removed as required by local regulating authorities. Ensure all services are in the proper state prior to commencing work.

# Project Management and Co-ordination Section 01 31 00 St. Lawrence Community Centre

.10 No claims will be considered which are based on delays or inconvenience resulting from the removal or relocation of services not being completed before the start of this Contract.

### 1.11 Contact for after-hours or emergency services

.1 When after-hours work is permitted by the Owner, provide an after-hours phone or pager number to respond to emergencies or requirements that arise when offices are closed.

### 1.12 Signs and identification

.1 Display no signs or advertisements without the Owner's approval. When signs are permitted, maintain signs in good condition during the Work and remove signs as directed by the Owner upon completion of the Work.

### 2 Products – not used

### 3 Execution

### 3.1 Coordination

- .1 Coordinate all construction operations to verify efficient and orderly installation of each part of Work.
- .2 Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation with Subcontractors.
- .3 Schedule construction operations in sequence required where installation of one part of Work depends on installation of other components, before or after its own installation.
- .4 Coordinate installation of different components with Subcontractors to verify maximum accessibility for required maintenance, service, and repair.
- .5 Make adequate provisions to accommodate items scheduled for later installation.
- .6 Prepare memoranda where necessary, for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

# Project Management and Co-ordination Section 01 31 00 St. Lawrence Community Centre

.7 Prepare similar memoranda for Owner where coordination of Owner-installed Work is required.

### 3.2 General Installation Provisions

- .1 Ensure that installer of each major component inspects both substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- .2 Comply with manufacturer's installation instructions and recommendations, to extent that those instructions and recommendations are more explicit or stringent than requirements contained in the Contract Documents.
- .3 Inspect Materials immediately upon delivery and again prior to installation. Reject damaged and defective items and arrange for replacement.
- .4 Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- .5 Supervise all Subcontractor work.
- .6 Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect.
- .7 Isolate each part of completed construction from incompatible material as necessary to prevent deterioration.
- .8 Coordinate temporary enclosures with required inspections and tests, to minimize necessity of uncovering completed construction for that purpose.
- .9 Install individual components at standard mounting heights recognized within the industry for the applications indicated where mounting heights are not indicated. Confirm non-standard specified mounting heights with Consultant prior to installation.
- .10 Coordinate construction activities to ensure that no part of Work completed or in progress is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

# 3.3 Layout of Work

- .1 Be responsible for laying out the work in compliance with the Drawings, Shop Drawings and schedules.
- .2 Rectify all errors resulting from failure to follow or verify Products, Drawings or the proper layout of any element of the installation.

### 3.4 **Protection of existing facility and personnel**

- .1 Do not endanger in any way the personnel, equipment, offices and existing structures of the Owner. Exercise caution to keep the existing facilities free from damage due to the Contractor's work. If the measures observed by the Contractor are not considered sufficient, the Owner may order additional precautions to be taken.
- .2 Take all necessary precautions to adequately protect the building and property from damage. Make good all damage at no extra cost.
- .3 Erect suitable safety barriers as required for security and to make the site safe for pedestrians.
- .4 Supply and erect temporary hoarding and barricades where required. Provide a temporary hoarding plan.
- .5 Remove the barriers from the site at the completion of the work or when directed by the Owner.
- .6 Adequately protect the Work at all stages and maintain the protection until the Work is completed. Remove and replace any work and materials damaged that cannot be satisfactorily repaired at no extra cost.
- .7 Secure construction area by erecting dust proof barriers, hoarding, as necessary to the approval of the Consultant and the Owner.

### 3.5 Restoration of disturbed areas

- .1 Fill all holes left from mechanical and electrical services removed or relocated to maintain the required fire separations and to maintain the intended finished appearance of the surface.
- .2 Patch and make good all existing floor, wall and ceiling materials and finishes disturbed by construction work.

### 3.6 Restoration work for uncovered site hazards

- .1 Make restorations to uncovered or disrupted mechanical or electrical services where such services pose a potential health or safety risk.
- .2 Restorations shall be an extra to the Contract only where such work could not have been reasonably foreseen by examination at the time of bidding in the sole opinion of the Owner.

End of section

### 1 General

### **1.1 Section includes**

- .1 Pre-construction meeting.
- .2 Regular progress meetings.

### 1.2 Related Requirements

.1 Section 01 32 00 Construction progress documentation

### **1.3 Pre-construction meeting**

- .1 Owner will arrange for a pre-construction meeting to discuss and resolve administrative procedures and responsibilities prior to the commencement of the Work. Owner's project team, the Consultant and a representative from the facility user department will participate in the pre-construction meeting.
- .2 Coordinate and organize attendance at the pre-construction meeting by representatives of major Subcontractors and other parties in contract with the Contractor.
- .3 Owner will arrange attendance of other interested parties not responsible to the Contractor.
- .4 Agenda will include, but not be limited to, the following topics as are pertinent to the Contract:
  - .1 Introduction of key personnel participating in the project
  - .2 Project communications procedures
  - .3 Restrictions on working hours, access, movements on site, etc.
  - .4 Reviewing the approved project schedule
  - .5 Contract administration requirements including submittals, payment procedures, and Change Order procedures
  - .6 Identify any product availability problems and substitution requests and procedures
  - .7 Review Consultant's inspection requirements
  - .8 Schedule for project meetings
  - .9 Temporary services to be provided by the Contractor
  - .10 Emergency contact numbers
  - .11 Site-specific safety training



.12 Site security requirements

### **1.4 Progress meetings**

- .1 Consultant will schedule and administer bi-weekly project meetings throughout progress of Work.
- .2 Consultant will distribute written notice of each progress meeting four (4) days in advance of meeting date to the Owner, Contractor and the other affected parties.
- .3 Provide physical space and make arrangements for meetings.
- .4 Consultant will prepare agenda for meetings.
- .5 Agenda will include, but not be limited to, the following topics as are pertinent to the Contract.
  - .1 Review, approval of minutes of previous meeting.
  - .2 Construction safety
  - .3 Coordination
  - .4 Review of Work progress since previous meeting.
  - .5 Field observations, problems, conflicts.
  - .6 Problems which impede construction schedule.
  - .7 Review of off-site fabrication delivery schedules.
  - .8 Revision to construction schedule.
  - .9 Progress schedule, up to next scheduled meeting.
  - .10 Review submittal schedules: expedite as required.
  - .11 Maintenance of quality standards.
  - .12 Review proposed changes for effect on construction schedule and on completion date.
  - .13 Review site safety and security issues.
  - .14 Requests for information/clarification
  - .15 Contemplated changes
  - .16 Other business.
- .6 Ensure key project personnel attend regularly scheduled progress meetings to be held on site at times and dates that are mutually agreed to by the Owner and Contractor.

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- .7 Coordinate and organize attendance of individual Subcontractors and material suppliers when requested. Relationships and discussions between Subcontractor participants are not the responsibility of the Consultant and do not form part of the meetings content.
- .8 Ensure that Contractor representatives in attendance at meetings have required authority to commit Contractor to actions agreed upon. Assign same persons to attend such meetings throughout the contract period.
- .9 Owner will preside at meetings.
- .10 Consultant will record minutes.
- .11 Consultant will reproduce and distribute copies of minutes within 3 calendar days after each meeting and transmit to meeting participants and affected parties not in attendance.
- 2 Products not used
- 3 Execution not used

# End of section

### 1 General

### 1.1 Section includes

- .1 Construction schedule.
- .2 Schedule of submittals.

### 1.2 Related requirements

- .1 Section 01 11 00 Summary of work
- .2 Section 01 33 00 Submittal procedures.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 07.

### **1.3 General requirements**

- .1 Be responsible for planning and scheduling of the Work.
- .2 Be responsible for ensuring that Subcontractors plan and schedule their respective portions of the Work within the overall project schedule.

### 1.4 Construction schedule

- .1 Submit a preliminary construction schedule, in duplicate, within Seven (07) calendar days after the date of the Notice of Contract Award.
- .2 Submit a fully detailed construction schedule, in duplicate, within Fourteen (14) calendar days after the date of the Notice of Contract Award.
- .3 Consultant will review schedules and return review copy within seven (7) calendar days after receipt.
- .4 Revise and resubmit construction schedules within seven (7) calendar days.
- .5 Schedule Format
  - .1 Prepare construction schedule in form of a horizontal Gantt bar chart using Microsoft Project (MSP) software.
  - .2 Provide a separate bar for each major operation and item of work.
  - .3 Split horizontally for projected and actual performance.
  - .4 Provide horizontal time scale identifying first Working Day of each week.
  - .5 Identify critical path.



# Construction Progress Documentation Section 01 32 00 St. Lawrence Community Centre

- .6 Show complete sequence of construction by activity, identifying work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- .7 Indicate submittal dates as provided in the Schedule of Submittals according to Article 1.5 of this Section, and all critical Product delivery dates, including those furnished by Owner and required by
- .8 Include dates for commencement and completion of each major element of construction including, but not limited to, the following:
  - .1 Locate Site utilities.
  - .2 Demolition work.
  - .3 Concrete work.
  - .4 Roofing work
  - .5 Mechanical work
  - .6 Electrical work
  - .7 Finishes.
- .9 Submit updated construction schedule with each application for payment and whenever requested by the Consultant, identifying changes since the previous version.
- .10 Construction schedule updates:
  - .1 Indicate projected percentage of completion of each item as of first day of month.
  - .2 Indicate progress of each activity to date of submission schedule.
  - .3 Indicate changes occurring since previous submission of schedule:
    - .1 Major changes in scope.
    - .2 Activities modified since previous submission.
    - .3 Revised projections of progress and completion.
    - .4 Other identifiable changes.
  - .4 Provide a narrative report to define:
    - .1 Problem areas, anticipated delays, and impact on schedule.
    - .2 Corrective action recommended and its effect.
    - .3 Effect of changes on schedules of other prime contractors.



### 1.5 Schedule of Submittals

- .1 Provide a schedule of all submittals including, but not limited to, the following:
  - .1 Shop Drawing and Product data submission schedules.
  - .2 Sample submission schedule, where applicable.
  - .3 Product delivery schedule.
  - .4 Shutdown or closure activity.
- .2 Schedule format
  - .1 Prepare schedule in form of a horizontal Gantt bar chart.
  - .2 Provide a separate bar for each major operation and item of work.
  - .3 Split horizontally for projected and actual performance.
  - .4 Provide horizontal time scale identifying first Working Day of each week.
- .3 Schedule submission timelines
  - .1 Submit specified schedules within Fourteen (14) calendar days of receipt of Notice of Contract Award).
  - .2 Submit two (2) copies of each schedule.
- .4 Consultant will review schedule and return review copy within seven (7) calendar days after receipt.
- .5 Resubmit finalized schedule within seven (7) calendar days after return of review copy.
- .6 Submit updated schedules with each application for payment.
- .7 Distribute copies of revised schedule to:
  - .1 Job site office.
  - .2 Subcontractors.
  - .3 Other concerned parties.
- .8 Instruct recipients to report to Contractor within no more than ten (10) calendar days, any problems anticipated by timetable shown in schedules.

### 2 Products – not used



3 Execution – not used

End of section

### 1 General

### 1.1 Section includes

- .1 Shop Drawings and Product data.
- .2 Samples.
- .3 Certificates and transcripts.

#### **1.2** Related requirements

- .1 Section 01 32 00 Construction Progress Documentation.
- .2 Section 01 78 00 Closeout Submittals.
- .3 This section describes requirements applicable to all Sections within Divisions 02 to 07.

#### **1.3** Administrative Requirements

- .1 Submit to Consultant all submittals listed for review.
- .2 Work affected by a submittal shall not proceed until review is complete.
- .3 Present Shop Drawings, samples and mock-ups in SI (metric) units unless Imperial measurements are used on the Drawings.
- .4 Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents.
- .5 Submittals not stamped, signed, dated, identified as to specific project, and attesting to their being reviewed will be returned without being examined and shall be considered rejected.
- .6 Time required by the Consultant and Owner to review the fourth and subsequent re-submittals to correct errors and address previous comments will be charged back to the Contractor.
- .7 Notify Consultant in writing at time of submission identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .8 Verify field measurements and affected adjacent Work are coordinated.
- .9 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.



- .10 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
- .11 Keep one (1) reviewed copy of each submission on site.

### 1.4 Shop Drawings, Product Data and Engineered Submissions

- .1 Herein term "Shop Drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures Product data and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to Drawings and Specifications.
- .3 Shop Drawings shall carefully consider architectural intent and shall be coordinated to ensure items to be exposed in finished work are located to provide best aesthetics as directed or required by the Consultant. Show orientation and relationships between materials where deemed necessary by the Consultant.
- .4 Include in every shop drawing submission, a copy of the relevant specification section, with addendum updates included where applicable, and all referenced and applicable sections, with addendum updates included where applicable. Check-mark each paragraph to indicate compliance with the specification or mark otherwise to indicate requested deviations from specified requirements. Check marks denote full compliance with a paragraph in its entirety. If deviations from the specifications are indicated, underline each point of deviation and denote by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance with the specified requirements. Provide in the submittal a detailed, written justification for each deviation.
- .5 Failure to include a copy of the marked-up specification sections, along with justifications for any requested deviations to specified requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.
- .6 Submit all Shop Drawings electronically. Each submittal shall be a single PDF file complete with transmittal letter, check marked specifications, and Shop

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Drawings. The Owner reserves the right to require that a submittal be submitted in hard copy.

- .7 Allow five (5) Working Days for Consultant's review of each submission.
- .8 Adjustments made on Shop Drawings by the Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior, and obtain Consultant's approval prior to proceeding with Work.
- .9 Make changes in Shop Drawings as the Consultant may require, consistent with Contract Documents. When resubmitting, notify the Consultant in writing of any revisions other than those requested.
- .10 Accompany submissions with transmittal letter, containing:
  - .1 Date
  - .2 Make
  - .3 Company
  - .4 City of Toronto's project title and tender number.
  - .5 Contractor's name and address.
  - .6 Identification and quantity of each Shop Drawing, Product data and sample.
  - .7 Other pertinent data
- .11 Submissions 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 the Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
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- .3 Setting or erection details.
- .4 Capacities.
- .5 Performance characteristics.
- .6 Standards.
- .7 Relationship to adjacent work.
- .12 After Consultant's review, distribute copies.
- .13 Delete information not applicable to project.
- .14 Supplement standard information to provide details applicable to project.
- .15 If upon review by the Consultant, no errors or omissions are discovered or if only minor corrections are made, two (2) copies will be stamped "reviewed" or "reviewed as modified" and returned and fabrication and installation of Work may proceed. If Shop Drawings are returned stamped "not reviewed", noted copy will be returned and re-submission of corrected Shop Drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .16 The review of Shop Drawings by the Consultant is for sole purpose of ascertaining conformance with general design concept. This review shall not mean that the Consultant approves detail design inherent in Shop Drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in Shop Drawings or of his responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.
- .17 Whenever there is a requirement for the Contractor to submit drawings with the seal of a Professional Engineer, such submissions shall be within the timelines of the project.

## 1.5 Samples

- .1 Submit for review samples as requested in respective Specification Sections. Label samples with origin and intended use.
- .2 When requested by Consultant, provide samples within seven (7) Working Days of such request.

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- .3 Notify the Consultant in writing, at time of submission, of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by the Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant, and obtain the Consultant's approval prior to proceeding with Work.
- .6 Make changes in samples which Consultant may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

## 2 Products – not used

## 3 Execution

## 3.1 Submissions

- .1 Submit the following to the Owner:
  - .1 During Construction
    - .1 Progress Reports
    - .2 Update of any Insurance Certificates about to expire
    - .3 Current valid WSIB Clearance Certificate
    - .4 Shop Drawings, Product data and samples
    - .5 Minutes of Meetings
    - .6 Inspection Reports
    - .7 Change Orders and Change Directives
    - .8 Requests for Information (RFI)
    - .9 Updated construction drawings
    - .10 Updated construction schedule
    - .11 Pre-Start Health and Safety Report
  - .2 At Substantial Performance, provide originals of:
    - .1 Statutory Declaration
    - .2 Substantial Performance Release of Claims Letter
    - .3 Update of any Insurance Certificates about to expire

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	.4	Current Valid WSIB Certificate of Clear	ance
	.5	Extended Warranties, if applicable	
	.6	Closeout Submittals. Refer to Section 0	1 78 00.
.3 At Completion			
	.1	Update of any Insurance Certificates at	pout to Expire
	.2	Current Valid WSIB Certificate of Clear	ance
	.3	Completion Release of Claims Letter	
.4 Attend of Warranty Period			
	.1	Final Release of Claims Letter	
End of section			

#### 1.1 References

- .1 Province of Ontario website
  - .1 Construction site health and safety during COVID-19
    - .1 <u>https://www.ontario.ca/page/construction-site-health-and-safety-</u> <u>during-covid-19</u>
  - .2 Resources to prevent COVID-19 in the workplace
    - .1 <u>https://www.ontario.ca/page/resources-prevent-covid-19-</u> workplace#construction
- .2 Canadian Construction Association
  - .1 <u>COVID-19 Standardized Protocols for All Canadian Construction Sites</u>

### **1.2 Health and safety policy**

- .1 Obtain copies of all Subcontractors' Health and Safety Policies and Programs prior to such Subcontractor commencing work on the site if and when requested.
- .2 Provide a copy of Contractor's current Health and Safety Policies and Program, to implement that policy prior to the commencement of construction.

#### **1.3** Health and safety legislation and requirements

- .1 Comply with all Federal and Provincial laws relating to Health and Safety including Acts and Regulations as well as Lower Tier Municipality By-Laws.
- .2 Comply with all applicable industry safety standards.
- .3 Comply with 213/91 (Construction Projects) made under the Occupational Health and Safety Act (OHSA) and all amendments thereto. Copies of the Regulations may be obtained from the Ministry of Labour at their Scarborough office, Publications Ontario at 880 Bay Street, Toronto, Ontario M7A 1N8 (Tel. 416-326-5300).
- .4 Comply with legislative requirements for work performed including, but not limited to, qualifications of workers, training, supervision and use of onsite equipment.
- .5 Provide any and all personal protective equipment for Contractor's own workers where prescribed by legislation.



## 1.4 COVID-19 Health and Safety

- .1 Ensure that all workers comply with the Government of Ontario's guidelines for <u>Construction Site Health and Safety During COVID-19</u>including but not limited to:
  - .1 washing hands often with soap and water or alcohol-based hand sanitizer
  - .2 sneeze and cough into sleeve
  - .3 avoid touching eyes, nose or mouth
  - .4 avoid contact with people who are sick
  - .5 stay home if you are sick
  - .6 avoid close contact with other people. Close contact includes being within two (2) metres of another person.
- .2 The Contractor shall monitor the latest recommendations from public health officials related to protecting workers from COVID-19 and adjust work procedures and provide personal protective equipment as per those recommendations.
- .3 All workers attending the Place of the Work shall complete a COVID-19 prescreening checklist each day when arriving on site and before beginning any work. Provide completed checklists to the Facility Supervisor each day.
- .4 The Contractor is encouraged to follow the latest edition of the Canadian Construction Association's document "<u>COVID-19 - Standardized Protocols for</u> <u>All Canadian Construction Sites</u>."

## 1.5 Safety data sheets

- .1 Provide to the Consultant a list of Designated Substances that will be brought to the site prior to commencing work. Safety Data Sheets (SDS) and the hazardous material inventory for each substance listed must be kept on the Project.
- .2 Maintain copies of current SDS at the Place of the Work at a location accessible to all workers, the Consultant, the Owner and facility operators.

#### **1.6** List of designated substances at the site

.1 In accordance with the requirements of Section 30(1) of the Occupational Health and Safety Act, the Bidder is hereby advised that the designated ABCON

substances as listed hereunder are or may be present on the site and within the limits of this Contract:

Designated Substance	Identified on this Site?	Location
Acrylonitrile	Unknown	
Arsenic	Unknown	
Asbestos	Unknown	
Benzene	Unknown	
Coke Oven Emissions	Unknown	
Ethylene Oxide	Unknown	
Isocyanate	Unknown	
Lead	Unknown	
Mercury	Unknown	
Silica	Yes	Concrete
Vinyl Chloride	Unknown	

- .2 Comply with the governing Ministry of Labour regulations respecting protection of workers, removal, handling and disposition of any Designated Substances encountered in carrying out the Work proposed on this contract.
- .3 Prior to commencement of this work, provide written notification to the Ministry of the Environment, Conservation and Parks at their, 900 Bay Street, Toronto, Ontario M7A 2A2, of the location(s) proposed for disposal of Designated Substances. Provide a copy of the notification to the Consultant a minimum of two weeks in advance of such work starting.
- .4 If the Ministry of the Environment, Conservation and Parks has concerns with any proposed disposal location, provide further notification until the Ministry's concerns have been addressed.
- Should a Designated Substance not herein identified be encountered, immediately notify the Consultant and the Owner of the Contractor's findings.
   Management of such substance shall be treated as extra work.



## 1.7 Health and safety warnings

- .1 The Consultant and the Owner shall have the right to document all Contractors for all health and safety warnings and/or to stop any Contractor's work if the Contractor fails to comply with any requirements under this Section.
- .2 Similarly, the Consultant and the Owner shall have the right to issue warnings and/or to stop work for any Contractor violations of the contract including Toronto health and safety policy and programs and/or if the Contractor creates a health or safety hazard.
- .3 Written warnings and/or stop work orders shall be given to the Contractor using the Owner's Contractor Health and Safety Warning / Stop Work Order Form.
- .4 If the Contractor fails to adequately respond to the Consultant's or the Owner's order to correct a hazard, the Owner reserves the right to have the hazard corrected by a third party at the Contractor's expense. The Consultant's or the Owner's decision, as the case may be, as to the urgency for such correction shall be final.

### 1.8 Notice of project

.1 Notify all regulatory bodies required for construction activities, (i.e., Notice of Project, employer notification, etc.). Notifications shall include, but not be limited to, the notification requirements laid out in OHSA Sec 51-53 and the requirements of Ontario Regulation 213/91 for Construction Projects, Sections 5, 6 and 7. For the purpose of this contract the Contractor shall be the "Constructor".

## 1.9 Confined space

- .1 Persons intended to work in confined spaces, as defined by the Owner, must have formal training in performing work in confined spaces.
- .2 Provide proof of valid certificates of such training for all workers prior to entry of such workers into confined spaces.
- .3 Provide all necessary safety equipment for entry into confined spaces.
- .4 Where workers are required to enter a confined space, as defined by the OHSA, O. Reg. 632/05 Section 221.2, ensure that workers of the Contractor and all Subcontractors follow the requirements of the above legislation, including but not limited to:

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- .1 having a method for recognizing each confined space to which the program applies
- .2 having a method for assessing the hazards to which workers may be exposed
- .3 having a method for the development of confined space entry plans (which include on-site rescue procedures)
- .4 having a method for training workers
- .5 having an entry-permit system.
- .5 Supply the necessary tools and equipment for workers to perform the confined space entry. These items include, but are not limited to, required documentation, gas detectors, breathing equipment, fall protection and rescue equipment.

## 1.10 Fire safety requirements

- .1 Protect persons and properties.
- .2 Maintain operable fire protection equipment.
- .3 Maintain fire fighters' access.
- .4 Provide temporary fire extinguishing equipment.
- .5 Maintain existing and temporary fire exit.
- .6 Where the work requires the Contractor to shut down fire and life safety systems, provide a fire watch for the duration of the shutdown.
- .7 In occupied buildings, schedule the use of flame, such as torches and volatile substances well in advance with the approval of the Owner and the Consultant.
- .8 Maintain a fire watch after all welding operations for a period of not less than seven (7) hours.

## 2 Products –not used

3 Execution – not used



#### **1.1 Section includes**

- .1 Laws, notices, permits and fees.
- .2 Discovery of hazardous materials.
- .3 Codes and standards.
- .4 Regulations.
- .5 Permits.

#### **1.2** Related requirements

.1 This section describes requirements applicable to all Sections within Divisions 02 to 07.

#### 1.3 Laws, notices, permits and fees

- .1 The laws of the Place of the Work shall govern the Work.
- .2 The Owner will obtain and pay for the building permit.
- .3 The Contractor shall be responsible for obtaining all permits, licenses and certificates necessary for the performance of the Work which were in force at the date of executing the Agreement.
- .4 Provide the required notices and comply with the laws, ordinances, rules, regulations or codes which are or become in force during the performance of the Work and which relate to the Work, to the preservation of the public health and to construction safety.
- .5 Construction of the Work is subject to the approval, inspection, by-laws, and regulations of municipal, provincial and federal authorities and organizations concerned with roads, streets, railways, telephones, electrical supplies, gas supplies and other public services having jurisdiction in respect to any matter in the Contract.
- .6 If the Contractor knowingly performs or allows work to be performed that is contrary to any laws, ordinances, rules, regulations or codes, the Contractor shall be responsible for and shall correct the violations thereof; and shall bear the costs, expenses and damages attributable to the failure to comply with the provisions of such laws, ordinances, rules, regulations or codes.
- .7 Determine detailed requirements of authorities having jurisdiction.



- .8 Pay all fees associated with applications, permits and inspections required by authorities having jurisdiction.
- .9 Pay construction damage deposits levied by municipality in connection with the issuance of a building permit.
- .10 Keep a copy of all permits on site.

## 1.4 Hazardous material discovery

.1 Asbestos: If material resembling asbestos is encountered which has not been identified in the Contract Documents, immediately stop work and notify the Consultant.

## 1.5 Codes and standards

- .1 Perform the Work in accordance with the requirements of the latest editions of the following statutes and codes in force at the time of the
  - .1 Ontario Building Code
  - .2 Municipal building and fire codes and by-laws
  - .3 Electrical Safety Authority
  - .4 Ontario Electrical Safety Code
  - .5 National Fire Protection Association
  - .6 Ontario Construction Safety Act
  - .7 Ontario Fire Code
  - .8 Ontario Hydro
  - .9 WHIMS
  - .10 Canadian Gas Association CSA/CGA B149.1-10 Natural Gas and Propane Installation Code
  - .11 Code book B139 for gas installations as per TSSA requirements.
- .2 Comply with any applicable revisions to codes and regulations after the date of the agreement. Costs of such revisions shall be compensated for through a Change Order.
- .3 Complete all required electrical connections and provide Electrical Safety Authority (ESA) approval on such work.
- .4 Be responsible for all variances and submit application to Technical Standards & Safety Authority (TSSA).



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- .5 Revise the installation and engineered drawings at no additional cost to the Owner until they meet the requirements and approval of the TSSA, the ESA and City of Toronto Fire Department. Provide copies of all authority sign-offs.
- .6 Review Contract Drawings and Specifications for any conflicts with the above regulations and where there are apparent discrepancies, notify the Owner in writing and obtain clarification before proceeding with the Work.

### **1.6 Precedence of standards**

- .1 Where applicable, ensure that all materials and equipment conform to the applicable standards listed.
- .2 Canadian standards take precedence over American standards in the case of duplication or conflict.

### 1.7 Permits

- .1 Obtain all necessary permits (except building permit) and approvals required for this project from the authorities having jurisdiction for all completed work.
- .2 Keep a copy of all permits on site.

### 2 Products

#### 2.1 Equipment

.1 Provide electronically powered equipment, components, and supplies that are CSA and ULC approved.

## 3 Execution – not used

#### **1.1 Section includes**

- .1 Inspection and testing, administrative and enforcement requirements.
- .2 Tests and mix designs.
- .3 Mock-ups.
- .4 Written and electronic reports.
- .5 Equipment and system adjust and balance.

#### **1.2 Related requirements**

- .1 Section 01 21 13 Cash Allowances.
- .2 This section describes requirements applicable to all Sections within Divisions 02 to 07.

#### **1.3 Reference standards**

- .1 ISO/IEC 17025-2005 General Requirements for the Competence of Testing and Calibration Laboratories.
- .2 SCC (Standards Council of Canada).

### 1.4 Review by Consultant

- .1 Consultant may order any part of the Work to be reviewed or inspected if Work is suspected to be not in accordance with Contract Documents.
- .2 If, upon review such work is found not in accordance with Contract Documents, correct such Work and pay cost of additional review and correction.
- .3 If such Work is found in accordance with Contract Documents, Owner will pay cost of review and replacement.

#### **1.5 Quality of Products and Materials**

.1 All materials, fixtures, fittings, appliances and apparatus supplied and installed by the Contractor shall be new, the best of their kind for the application and free from any defects.

### 1.6 Quality Control Inspection and Testing

- .1 At reasonable times and giving reasonable notice of at least twenty-four (24) hours, the Owner may inspect the work site and/or those areas of the Contractor's place of business that are related to the performance of the Contract. If the Owner requires an inspection, the Contractor must provide reasonable assistance and arrangements for the inspection to take place.
- .2 Where required by the Consultant, the Contractor shall supply certified copies of all tests upon, all materials to be used in the construction of the works, indicating that materials comply with the Specifications. Such tests shall be made by a testing company which has been approved by the Consultant and shall be at the Contractor's expense.
- .3 Materials whose test specimens fail to meet specified requirements and those materials which are rejected upon inspection shall not be permitted to remain on the site of the work and shall be immediately removed from the site of the work by the Contractor at their own expense.
- .4 In addition to the above items, the Contractor shall arrange and pay for the
  - .1 Inspection and testing required by law, ordinances, rules, regulations or Authorities having jurisdiction
  - .2 Inspection and testing performed exclusively for the Contractor's convenience
  - .3 Testing, adjustment and balancing of mechanical and electrical equipment and systems.
  - .4 Tests specified to be carried out by the Contractor under the supervision of the Consultant
  - .5 The cost of all specified testing of piping systems, tanks, etc. shall be included in the cost in the Contract

#### **1.7** Receipt and acceptance of materials

- .1 During the process of unloading any equipment and materials, inspect equipment and materials in the presence of the Consultant for loss or damage in transit. Notify the agent of the carrier of any loss or damage to the shipment.
- .2 All equipment and materials supplied by the Contractor and found faulty or defective upon delivery will be rejected by the Consultant and shall be replaced by the Contractor at their own expense, but failure to discover same shall not



## **Quality Control**

Section 01 45 00 St. Lawrence Community Centre

relieve the Contractor of responsibility for removing all faulty materials supplied by him and replacing same with good materials which he shall supply all at his own cost and expense.

.3 The unloading of all equipment shall be carefully performed in an approved manner to avoid damage to such equipment. Ample facilities shall be provided by the Contractor for handling the equipment.

## 1.8 Quality assurance testing by the Owner

- .1 The Owner may request any required samples at any reasonable time.
- 2 Products not used
- 3 Execution not used



#### **1.1 Section includes**

- .1 Storage of Products and materials.
- .2 Contractor's site office.
- .3 Temporary sanitary facilities and shelter for Contractor's workers.
- .4 Temporary building enclosures and storage areas.
- .5 Temporary fire protection
- .6 First aid
- .7 Security of construction site
- .8 Maintenance of sewerage flows, storm sewers and drainage.

#### 1.2 Related requirements

.1 This section describes requirements applicable to all Sections within Divisions 02 to 07.

#### 2 Products-not used

#### 3 Execution

#### 3.1 General

- .1 Building operations take priority over Contractor operations. When Contractor operations necessarily impact building operations and use, review impacts with the Consultant, the Owner and the facility supervisor and provide temporary facilities to the satisfaction of the Consultant.
- .2 All schedules must indicate contingency and alternate date and times in the event of postponement for any reason, or breakdown of temporary by-pass equipment during the shutdown.
- .3 Comply with local Police, Fire Department and Paramedic requirements regarding notification of all interested parties concerning the construction work and provisions for traffic movement.

## 3.2 Storage of Products, materials and equipment

- .1 Storage areas are defined on the Drawings, or as designated by the Owner. Store materials to ensure the preservation of their quality and fitness for the work. Store materials on wooden platforms or other hard, clean surfaces off the ground or in a watertight storage shed of sufficient size for the storage of materials that might be damaged by storage in the open. Provide the shed with a wood floor raised a minimum of 150 mm clear of the ground.
- .2 Store materials to ensure the preservation of their quality and fitness for the work. Store materials on wooden platforms or other hard, clean surface off the ground. Locate stored materials to facilitate prompt inspection.
- .3 Provide weather tight heated storage sheds with raised floors for the storage of equipment, as required by the Consultant and/or equipment manufacturers.
  Provide all storage instructions from equipment suppliers well in advance of the scheduled delivery dates.
- .4 Handle and store products in a manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions.
- .5 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in the work.
- .6 Store products subject to damage from weather in weatherproof enclosures.
- .7 Store cementitious products clear of earth or concrete floors, and away from walls.
- .8 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .9 Store sheet materials, lumber, etc. on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .10 Store and mix paints in a heated and ventilated room. Remove oily rags and other combustible debris from the site daily. Take every precaution necessary to prevent spontaneous combustion.
- .11 Remove and replace damaged products to the satisfaction of the Consultant.
- .12 Do not use private property for storage purposes without the written permission of the property owner. Pay rental charges and damages associated with occupying private lands.



## 3.3 Temporary shelter and sanitary facilities for Contractor's workers

- .1 Provide suitable sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Keep sanitary facilities clean, properly maintained and fully stocked with the necessary supplies at all times.
- .3 Provide and maintain drinking water and washing facilities in accordance with governing regulations and ordinances.
- .4 Post notices and take such precautions as required by local health
- .5 Except where connected to municipal sewer system, periodically remove wastes from Site.
- .6 Provide shelter for workers.

#### 3.4 Location of temporary facilities

.1 Coordinate the location of temporary facilities with the facility operators subject to the satisfaction of the Consultant.

#### 3.5 Installation and removal of temporary facilities

- .1 Provide temporary facilities and controls to execute the work expeditiously.
- .2 Remove temporary facilities and controls at the conclusion of the Work, unless otherwise directed by Consultant.
- .3 Site to be left in tidy and clean condition after removal of all temporary facilities.

#### 3.6 Temporary building enclosures

- .1 Provide temporary weather tight enclosures and protection for exterior openings until permanent sash and glazing, exterior doors, louvers, etc., are installed.
- .2 Provide temporary enclosures for the work as required for weather protection and heating purposes.
- .3 Erect enclosures to allow accessibility for installation of materials and working inside the enclosure.
- .4 Keep temporary buildings in a clean and sanitary condition at all times and do not permit to become a health hazard or a nuisance to adjoining properties.



## 3.7 Temporary fire protection

.1 During the entire construction period provide fire extinguishers in each construction shed and temporary office, as well as in other locations reasonably required, and all other fire protection necessary to protect the project and to comply fully with the requirements of insurance underwriters for the project and local, provincial and federal authorities.

#### 3.8 Temporary first aid facilities

- .1 Provide and maintain the necessary first aid items and equipment as required.
- .2 Designate employees who are properly instructed to be in charge of first aid. Ensure that at least one such employee is always available on the site while work is being conducted.

#### 3.9 Maintaining existing sewerage flows

- .1 Maintain existing sanitary sewerage flows, where applicable, and provide alternative interim service utilizing duplicate portable sewage pumps, tank trucks and other approved means. Prevent interruption to service throughout the construction period and until the new works are placed in service.
- .2 Provide and install all temporary sumps, bulkheads and/or other works in existing sewers, maintenance holes and service connections and provide temporary pumps in duplicate and pipelines to dewater and control the sewage.
- .3 Discharge sewerage flows only to those sanitary sewers remaining in service or to tank trucks for approved disposal. Under no circumstances shall contaminated water be discharged or permitted to enter any drainage or natural watercourse.
- .4 Temporarily drain or pump any leakage to permit work to be performed in the dry. The Contractor's method shall be subject to the approval of the Consultant.

#### 3.10 Drainage ditches and storm sewers

.1 All ditches, drainage channels and/or storm sewer systems, which may be affected by construction shall have their flows maintained at all times during construction, unless permission to the contrary has been obtained from the Consultant. No extra cost shall be incurred by the Owner for this work.



.2 Make allowance in prices for any problems that may be encountered because of ditch flows or storm sewer flows. Drainage shall not be impeded, nor shall blockages or water backups be permitted. Any damage because of water or flooding shall be the responsibility of the Contractor.

#### 3.11 Security for construction site

.1 Be responsible for the security of construction site materials, tools, equipment, temporary facilities and storage and all construction.

## 3.12 Removal and restoration of temporary facilities and controls

- .1 Remove temporary facilities and controls from the site on completion of the works, or as otherwise ordered in writing by the Consultant. Unless specifically stated otherwise in the Contract Documents, maintain ownership over the temporary facilities including furnishings.
- .2 As each portion of the work is completed, as determined by the Consultant, restore disturbed areas, roadways, fences, building, etc. equal to or better than the initial condition and clean up the construction area as instructed by the Consultant.
- .3 Leave clean and in good order, roads, parking areas, walks, grassed areas and other areas disturbed by the construction and Contractor's activities. Failure to make satisfactory progress in the execution of this work within 48 hours of receipt of written notice from the Consultant may result in the Consultant having the surplus material removed, or re-grading any area or performing any work necessary to leave the site in a satisfactory condition and having the costs deducted from payments due under the Contract.



### 1.1 Section Includes

- .1 Product options.
- .2 Procedures for substitution requests submitted after award of the Contract.

#### **1.2 Related requirements**

.1 Section 3 to 07.

#### **1.3 General Product requirements**

.1 All Products and materials supplied shall have a low V.O.C. rating.

### 1.4 Specified product options

- .1 Performance or prescriptive standards:
  - .1 Select any product, assembly or component material that meets or exceeds the specified standards for products specified only by referenced standards and performance criteria.
- .2 Acceptable products:
  - .1 Products specified by component material name, manufacturer, catalogue number, model number, or similar reference establishing the standard of acceptance that the Consultant will consider appropriate for the Work. Select any named Product, assembly or component material contained in the listing of Acceptable Products.
- .3 Acceptable manufacturers:
  - .1 Select any product, assembly or component material manufactured by the listed Manufacturers that meets or exceeds the specified standards and performance criteria.
  - .2 Submit required Shop Drawing and Product data submissions before starting any work of the relevant Specification Section for review by Consultant. Product substitutions
- .4 Submit proposals for substitute Products or groups of Products in accordance with City of Toronto Substitute Form.
- .5 Owner is under no obligation to accept proposed substitute Products unless the Contractor can provide evidence satisfactory to the Consultant that such

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proposed substitute Product meets or exceeds the specified performance and other criteria.

## **1.5** Incorporation of specified Products

- .1 Coordinate the installation of the selected Products into the Work:
  - .1 Make any changes in the Work as may be required to accommodate the selected Products.
  - .2 Notify Consultant where a selected Product is inconsistent with the layouts and configurations indicated on Drawings and Schedules.
  - .3 Bear costs and waive claims for additional compensation for costs that are implicit in the use of the selected Products.

## 2 Products- not used

3 Execution- not used

### 1.1 Section includes

.1 Product delivery requirements and conditions.

### **1.2** Delivery requirements and conditions

- .1 Fully indemnify the Owner for all damages to persons or property resulting from the services and operations performed by employees of the Contractor and all Subcontractors and suppliers, and all contracted agents or carriers, including the delivery and unloading of goods or equipment at site.
- .2 Employ delivery vehicles that are suitably licensed, insured, operated and maintained in accordance with the Contract requirements, the Contractor's (and its agent's or carrier's) applicable policies and procedures, and all applicable federal, provincial and municipal legislation, statutes and by-laws.
- .3 Ensure that the Contractor's forces receive and sign off on all deliveries and shipments required for the Work. The Owner will not be responsible for the sign off on any deliveries for the Contractor.
- .4 Equip all delivery vehicles with any other material handling equipment required for the delivery person to safely unload the shipment at the receiving location(s) at the Place of the Work and move the Products to the designated receiving area(s) identified in the Contract.
- .5 Equip delivery vehicles, where required, with a hydraulic tailgate for unloading heavy equipment, packages, drums, pallets and similar large, heavy items at receiving locations which are not equipped with a truck loading dock.

## 2 Products – not used

3 Execution – not used

#### **1.1 Section includes**

- .1 Progressive cleaning.
- .2 Cleaning prior to application for Substantial Performance.
- .3 Cleaning prior to Completion.

#### 1.2 Related Requirements

.1 This section describes requirements applicable to all Sections within Divisions 02 to 07.

#### 1.3 Submittals

.1 Submit a disposal plan to the Owner and do not commence work prior to the Owner's approval of the disposal plan.

#### 2 Products

#### 2.1 Cleaning materials

.1 Cleaning agents and materials: Low VOC content.

#### 3 Execution

#### 3.1 **Progressive cleaning**

- .1 Maintain site in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other contractors.
- .2 Remove waste materials from site or dispose of waste materials as directed by Consultant. Do not burn waste materials on site.
- .3 Clear snow and ice from area of construction, bank or pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Make every reasonable effort to recycle or otherwise salvage the materials removed from the site.



- .6 Separate and recycle waste materials and dispose of them in accordance with local municipal requirements and policies.
- .7 Dispose of unused paint material at official hazardous material collections site approved by Owner.
- .8 Remove waste material and debris from site, or deposit in waste container(s), at end of each working day.
- .9 Waste containers, if allowed:
  - .1 Provide on-site steel framed, hinged lid containers for collection of waste materials and debris.
  - .2 Provide and use clearly marked, separate bins for recycling.
  - .3 Place waste containers in an area directed by the Owner. Pay for all associated costs and permits. Do not locate bins on a structural slab.
  - .4 Remove and replace waste containers promptly when full and upon completion of the work.
- .10 Storage of waste material and debris outside of the waste containers is not be permitted.
- .11 Clean interior areas prior to start of finish work and maintain areas free of dust and other contaminants during finishing operations.
- .12 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .13 Provide adequate ventilation during use of volatile or noxious substances. Use of enclosure ventilation systems is not permitted for this purpose.
- .14 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .15 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

## 3.2 Cleaning prior to application for Substantial Performance

- .1 Prior to applying for Substantial Performance of the Work, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.



- .3 Prior to final review, remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Owner or other contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and equipment.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Clean and polish surface finishes, as recommended by manufacturer.
- .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Sweep and wash clean paved areas.
- .16 Clean equipment and fixtures to a sanitary condition; replace all filters of mechanical equipment.
- .17 Remove debris and surplus materials from accessible concealed spaces.

#### 3.3 Cleaning prior to Completion

- .1 Execute final cleaning prior to Completion acceptance review.
- .2 Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.
- .3 Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

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.4	Replace all filters of operating equipment.
.5	Clean site; sweep paved areas, rake clean landscaped surfaces.
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.6 Remove waste and surplus materials, rubbish, and construction facilities from the site.



### **1.1 Section includes**

- .1 Inspections and declarations.
- .2 Spare parts, maintenance materials and special tools.
- .3 Operation and maintenance manual
- .4 Recording actual site conditions.
- .5 Record (as-built) documents and samples.
- .6 Record documents.

### 1.2 Related requirements

- .1 Section 01 31 00 Project management and coordination
- .2 Section 01 33 00 Submittal Procedures
- .3 Section 01 45 00 Quality control
- .4 This section describes requirements applicable to all Sections within Divisions 02 to 07.

#### **1.3** Inspections and declarations

- .1 **Contractor's inspection**: Contractor and all Subcontractors shall conduct an inspection of the Work, identify deficiencies and defects, issue list of deficiencies and repair as required to conform to the Contract Documents.
- .2 Notify the Consultant in writing of satisfactory completion of the Contractor's Inspection and that corrections have been made.
- .3 Request the Consultant's Inspection.
- .4 **Consultant's inspection**: Consultant and Contractor will perform an inspection of the Work to identify obvious defects or deficiencies. Consultant will generate a list of deficiencies. Correct defective and deficient Work accordingly.
- .5 Consultant will identify in inspection report all items deemed to affect issuance of Substantial Performance.
- .6 **Substantial Performance**: Contractor shall submit a written certificate that the following has been performed:

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- .1 Work has been completed and inspected for compliance with Contract Documents.
- .2 Defects have been corrected and deficiencies have been completed.
- .3 Equipment and systems have been tested, adjusted, balanced and are fully operational.
- .4 Certificates required by authorities having jurisdiction have been submitted.
- .5 Operation of systems have been demonstrated to Owner's personnel.
- .6 All required documentation has been submitted.
- .7 Work is complete and ready for Substantial Performance Inspection.
- .7 **Substantial Performance inspection**: When items noted in 1.3.6 above are completed, request Substantial Performance Inspection of the Work by the Consultant and the Owner. If Work is deemed incomplete by Consultant or Owner, complete all such outstanding items and request re-inspection.
- .8 **Declaration of Substantial Performance**: When the Owner/Consultant considers deficiencies and defects have been corrected and it appears requirements of the Construction Act with respect to Substantial Performance, as amended by the Supplementary Conditions, have been met, make application for Substantial Performance of the Work.
- .9 **Commencement of warranty period**: The date of Substantial Performance of the Work, as certified by the Owner, shall be the date for commencement of the warranty period.
- .10 **Commencement of lien period**: The date of publication of the certificate of Substantial Performance of the Work shall be the date for commencement of the lien period.
- .11 **Release of basic (statutory) holdback**: After issuance of certificate of Substantial Performance of the Work, submit an application for payment of the basic holdback retained by the Owner under the Construction Act.
- .12 **Total Performance**: Contractor shall submit a written certificate that the following has been performed:
  - .1 Entire work has been completed including the correction of all Contract Deficiencies and items listed in Article 1.3.6.
  - .2 Review the Contract Documents and inspect the Work to confirm that prerequisites to Total Performance have been met and that the Work is ready for inspection for Total Performance.

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- .13 **Total Performance inspection**: When items noted in 1.3.12 above are completed request Total Performance Inspection of the Work by the Consultant and the Owner. If Work is deemed incomplete by Consultant or Owner, complete all such outstanding items and request re-inspection.
- .14 **Declaration of Total Performance**: When the Owner/Consultant considers deficiencies and defects have been corrected and it appears requirements of the Construction Act with respect to Total Performance, as amended by the Supplementary Conditions, have been met the Consultant shall issue a Certificate of Total Performance of the Work, stating the effective date of Total Performance.
- .15 **Payment of finishing holdback**: After issuance of Certificate of Total Performance, submit an application for payment of finishing holdback retained by the Owner under the Construction Act.
- .16 **Final inspection**: Consultant and Owner will conduct a Final Inspection within three (3) months of the end of the warranty period. If deficient or defective Work is identified by Owner, correct deficient or defective Work and request re-inspection.
- .17 **Final payment**: When the Owner considers that all deficiencies and defects have been corrected and it appears all Contractor obligations under the Contract have been fulfilled, the Owner will issue a Final Acceptance Certificate and issue final payment.

## 1.4 Operation and maintenance manual

- .1 Prepare an operation and maintenance manual during the course of construction for all equipment installed.
- .2 Prepare instructions and data using personnel experienced in maintenance and operation of described Products and systems.
- .3 At least two (2) weeks prior to Substantial Performance of the Work, submit to the Consultant, (03) Three hard copies of the draft Operation and Maintenance Manual in Canadian English.
- .4 Operation and Maintenance Manual shall include copies of the manufacturer's Product data sheets and operating and maintenance manuals for all equipment installed. PDF file shall not have any security protection applied (i.e. no passwords).



- .5 Consultant will return a copy after the Substantial Performance inspection with Consultant's and Owner's comments.
- .6 Revise content of documents of the Operation and Maintenance Manual as required prior to final submittal.
- .7 Provide **a single PDF file** of the complete, final Operation and Maintenance Manual after acceptance by the Owner. The PDF file shall not have any security protection applied (i.e. no passwords).
- .8 Substantial Performance will not be granted until an acceptable Operation and Maintenance Manual has been submitted.

## 1.5 Operation and Maintenance Manual Format

- .1 Hard copy binders:
  - .1 Organize data in the form of an instructional manual.
  - .2 Provide vinyl, hard covered, 3 'D' ring, 8.5 inch x 11 inch binder with spine and face pockets.
  - .3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
  - .4 Cover:
    - .1 Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
  - .5 Arrange content by systems under Section numbers and sequence of Table of Contents.
  - .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
  - .7 Text: Manufacturer's printed data, or typewritten data.
  - .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .2 Electronic files:
  - .1 Single file in PDF format duplicating hard copy manual.
  - .2 Organize PDF file same as hard copy binders.
  - .3 Use PDFs from original electronic files, combined into a single file. Avoid scanning hard copy documents to PDF files.



### 1.6 Operation and maintenance manual contents

- .1 Each volume of the operation and maintenance manual shall include each item specified in this article.
- .2 Provide table of contents including:
  - .1 Title of project.
  - .2 Date of submission.
  - .3 Names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
  - .4 Schedule of products and systems, indexed to content of volume.
  - .5 For each product or system, list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data
  - .1 Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00.
- .4 Drawings
  - .1 Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Certificates of Acceptance
  - .1 Provide relevant certificates issued by Authorities Having Jurisdiction, including code compliance certificate, life safety systems performance certificate.

#### **1.7** Recording actual site conditions

- .1 Record information on set of black line drawings, and within the project manual, provided by Owner.
- .2 Annotate with red coloured felt tip marking pen, for recording changed information. As requested by the Consultant, use multiple colored marking pens to differentiate between systems.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is accurately recorded.

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	.4 Dra		ings an	d Shop Drawings	
		.1	Legib	ly mark each item to record actual construction	n, including:
			.1	Measured depths of elements of foundation i first floor datum.	n relation to finish
			.2	Measured horizontal and vertical locations of and appurtenances, referenced to permanen improvements.	underground utilities t surface
			.3	Measured locations of internal utilities and ap referenced to visible and accessible features	opurtenances of construction.
			.4	Field changes of dimension and detail.	
			.5	Changes made by change orders.	
			.6	Details not on original Contract Drawings.	
			.7	References to related shop drawings and mo	odifications.
	.5	Speci	ficatior	IS	
		.1	Legib	ly mark each item to record actual construction	n, including:
			.1	Manufacturer, trade name, and catalogue nu installed, particularly optional items and subs	mber of each product stitute items.
			.2	Changes made by Addenda and change orde	ers.
	.6	Other	Docur	nents	
		.1	Maint certifi	ain manufacturer's certifications, field test reco cations required by individual specifications se	ords, inspection ections.
1.8	As-bı	uilt doo	cumen	ts and samples	
	.1	In ado copy	dition to of:	o requirements in Section 01 31 00, maintain a	t the site one record
		.1	Revie	wed shop drawings, product data, and sample	es.
		.2	Field	test records.	
		.3	Inspe	ction certificates.	
		.4	Manu	facturer's certificates.	
	.2	Store for co	as-bui nstruct	t documents and samples in field office apart ion. Provide files, racks, and secure storage.	from documents used

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- .3 Label as-built documents and file in accordance with technical specification section number. Label each document "As-Built Documents" in neat, large, printed letters.
- .4 Maintain as-built documents in clean, dry and legible condition. Do not use asbuilt documents for construction purposes.
- .5 Keep as-built documents and samples available for inspection by Consultant.
- .6 Prior to Substantial Performance of the Work, provide final draft redline mark-up As-Built Drawings to Consultant with as-built dimensions and spatial arrangements.
- .7 Consultant will review the As-Built Drawings and provide comments to the Contractor with a copy to the Owner.
- .8 Revise As-Built Drawings taking the comments from the Consultant into account.
- .9 Submit final As-Built Drawings to the Consultant prior to requesting Substantial Performance.

## 2 Products

## 2.1 Materials and finishes

- .1 Building Products, Applied Materials, and Finishes: Provide product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.
- .2 Provide instructions for cleaning agents and methods; precautions against detrimental agents and methods; and recommended schedule for cleaning and maintenance.
- .3 Moisture-Protection and Weather-Exposed Products: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Building Envelope: Include copies of drawings of building envelope components, illustrating the interface with similar or dissimilar items to provide an effective air, vapour and thermal barrier between indoor and outdoor environments. Include an outline of requirements for regular inspections and for regular maintenance to ensure that on-going performance of the building envelope will meet the initial building envelope criteria.



.5 Additional Requirements: as specified in individual specifications sections.

## 2.2 Spare parts, maintenance materials and special tools

- .1 Receive and catalog all items. Check inventory against operation and maintenance manual. Include approved listing in operation and maintenance manual.
- .2 If requested, furnish evidence as to type, source and quality of products provided.
- .3 If requested, provide receipts for delivered spare parts, materials and tools prior to Substantial Performance of the Work.
- .4 Defective products will be rejected regardless of previous inspections. Replace defective products at own expense.
- .5 Pay all costs of transportation, duties, tariffs, etc.
- .6 Spare parts
  - .1 Provide spare parts, in quantities specified in individual specification sections.
  - .2 Provide identical items of same manufacturer, dye-lot or production run as items in the Work
  - .3 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in operation and maintenance manual.
  - .4 Obtain receipt for delivered products and submit prior to final payment.
- .7 Maintenance materials
  - .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
  - .2 Provide items of same manufacture and quality as items in Work.
  - .3 Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in operation and maintenance manual.
  - .4 Obtain receipt for delivered products and submit prior to final payment.

## 3 Execution

#### 3.1 Deliver to site

.1 Deliver spare parts, maintenance materials, and special tools to location as directed; place and store.



## 3.2 Storage, handling and protection

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.
- .5 Remove and replace damaged products at own expense and to satisfaction of Consultant.

## 1.1 Section Includes

- .1 Demolition, removal and disposal include but is not limited tp:
  - .1 Demolition related concrete repairs (concrete soffit, top surface concrete).
  - .2 Steel beams.
  - .3 Demolition work related to roofing replacement work.
    - .1 This section specifies the Work associated with the removal of the existing roof membrane assemblies, including removal of roof mounted equipment and the disposal of 0.5 in Dens Deck, EPDM membrane, filter sheet, concrete pavers and metal flashing.

The Contractor shall remove all the roof assembly at 230 The Esplanade on roofs A, B, C, D, E, F, G including all roofing membrane, flashing, sheet metal flashing, fasteners, damaged or rotten wood, caulking. The Contractor shall keep for reuse all existing insulation and ballast.

- .4 Demolition work related mechanical and electrical scope of work:
  - .1 Refer to mechanical and electrical drawings.
- .2 Removal of rubbish, debris, demolished fixtures, equipment, components and items not scheduled to remain Owner's property, resulting from the demolition and preparatory work.

## 1.2 Related Requirements

- .1 Section 03 01 30.71 Rehabilitation of cast-in-place concrete.
- .2 Section 03 03 00 Cast-in-place concrete.
- .3 Section 05 50 00 Metal Fabrication.
- .4 Section 07 55 00 Inverted Modified Bituminous Roofing.
- .5 Section 05 53 10 Ladders
- .6 Section 06 10 00 Rough Carpentry.
- .7 Section 07 62 00 Metal Flashing & Trim


## **1.3 Reference Standards**

- .1 American National Standards Institute (ANSI):
  - .1 ANSI A10.8-2011, Scaffolding Safety Requirements
- .2 National Fire Protection Association (NFPA):
  - .1 NFPA 241-2013, Standard for Safeguarding Construction, Alteration, and Demolition Operations
- .3 Canadian Standards Association (CSA):
  - .1 CSA S350 M1980 (R2003), Code of Practice for Safety in Demolition of Structures.
- .4 Occupational Health and Safety Act and regulations for Construction Projects.

## **1.4 Existing conditions**

- .1 Visit and examine the site and note all characteristics and irregularities affecting the work of this Section.
- .2 Roofing replacement:
  - .1 Parts of the structure which are not part this contract, shall be maintained in the condition existing on the date that the tender is accepted.
  - .2 Should material resembling spray or trowel applied asbestos be encountered, workers shall stop work and the Owner shall be immediately notified. Do not proceed until written instructions have been received from the Owner.

### 1.5 Submittals

.1 Where required by the Consultant/ Owner, submit for approval, drawings, diagrams, details and supporting data clearly showing sequence of demolition and removal work.

### 1.6 Protection

- .1 Prevent movement or settlement or other damages to adjacent work, utilities structures and the building. Provide and place Engineered bracing or shoring and be responsible for safety and support of such work. Be liable for any such movement or settlement, and any damage or injury caused.
- .2 Cease operations and notify Owner's Project Manager if safety of any adjacent work or structure appears to be endangered. Take all precautions to support the

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structure. Do not resume operations until reviewed with the Project Manager and Consultant.

- .3 Ensure safe passage of building occupants around area of demolition.
- .4 Prevailing weather conditions and weather forecasts shall be considered. Demolition work shall not proceed when weather conditions constitute a hazard to the workers and site.
- .5 Prevent debris from blocking surface drainage inlets and mechanical and electrical systems which remain in operation.
- .6 Maintain noise and inconvenience to building occupants and pedestrians to a minimum level.
- .7 Cover and protect equipment, benches, and fixtures from soilage or damage when demolition work is performed in areas where such items have not been removed. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Consultant and at no additional cost to Owner
- .8 Conduct demolition operations to prevent injury to occupants/pedestrians and damage to adjacent occupied areas. Ensure safe passage of people around demolition area.
- .9 At the end of each day's work, leave work in safe and stable condition so that no part is in danger of toppling or falling.
- .10 Where security within existing building has been reduced by demolition work, provide temporary means to maintain security acceptable to Consultant/ Owner.
- .11 Cease operations and notify Project Manager and Consultant immediately for special protective and disposal instructions when asbestos materials or other hazardous materials those were not identified in section 01 35 29 and are uncovered during the work of this project.
- .12 Provide protection required to enable existing building and equipment to remain in continuous and normal operations, and maintain construction schedule.
- .13 Support affected structure or building components and if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures and then cease operations and notify Consultant immediately.
- .14 Do not dispose of waste or volatile materials such as: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm



or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.

- .15 Do not interfere with, encumber, endanger or create nuisance, from any cause due to demolition work, to public property or any adjacent attached and/or detached structures in possession of Owner or others, which are to remain, whether occupied or unoccupied during this work.
- .16 Make good damage to such structures resulting from work under this Section at no cost to Owner. Make good adjacent building surfaces damaged by work of this Section.
- .17 Roofing replacement:
  - .1 It is the Contractor's responsibility to prevent damage to the existing building, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping and adjacent grades. The Contractor shall make good damages however so caused by the demolition. The Contractor shall be liable for all injury.
  - .2 The Contractor shall prevent debris from blocking drains. All drains and mechanical and electrical systems shall be maintained in operation.
  - .3 The Contractor shall prevent debris from dropping to the interior portion of the building including parts of fasteners.
  - .4 Protect structures and pedestrian traffic from falling objects.

## 1.7 Temporary Partitions

- .1 Erect and maintain dustproof partitions, seal off ducts as required to prevent spread of dust and fumes to other parts of the building. On completion, remove partitions and make good surfaces to match adjacent surfaces.
- .2 Provide required signage, barricades, hoarding, overhead protection, temporary egress and maintain all lights, signals and protection of all kinds for the protection of workmen on the Work, for the protection of adjoining property and for the protection of public.

## **1.8** Salvageable and recyclable materials

.1 Except where otherwise specified, all materials indicated or specified to be permanently removed from the Place of the Work shall become Contractor's property.



- .2 Remove items to be reused, store as directed by Consultant and re-install as indicated on the Tender drawing.
- .3 At no cost to Owner repair or replace material and/or equipment scheduled to remain which is damaged by demolition work. Do not sell any salvaged material or equipment directly from project site.
- .4 Remove waste debris continually and entirely from project site during demolition work. Do not load vehicles transporting such debris beyond their safe capacity or in a manner which might cause spillage on public or private property. If spillage does occur, clean up immediately to prevent traffic hazards or nuisance.

## 1.9 Scheduling

- .1 Coordinate demolition and removal of debris to ensure minimal disruption to occupied area of the building.
- .2 Execute work with least possible interference, inconvenience or disturbance to occupants, public and normal use or premises. Keep noise and dust to minimum.

### 2 Products

#### 2.1 Repair Material

- .1 Use repair materials identical to existing materials:
- .2 If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
- .3 Use a material whose installed performance equals or surpasses that of existing material.

#### 3 Execution

#### 3.1 Preparation

- .1 Inspect and photograph existing conditions, including elements subject to damage or movement during demolition. Conduct a condition survey of existing building structures and services to remain before commencing demolition.
- .2 Review drawings, site conditions, and other specification sections to ascertain the extent and nature of work of this section.



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- .3 Utilize dustproof rigid hording and temporary partitions to fully isolate the demolition work from existing occupied areas. Maintain until such work is complete. Contractor will be responsible for any and all contamination to occupied areas outside of the demolition area.
- .4 Take precautions to prevent dust from triggering fire alarm smoke detectors and plugging ducts and filters. If necessary, arrange for temporary shutdown of this equipment. Contractor will be responsible for all damages.
- .5 Provide and maintain temporary fire protection equipment during performance of work required by and governing codes, regulations and bylaws.
- .6 Prior to start of any demolition ensure contaminated or hazardous materials have been removed from site and dispose of at designated disposal facilities in safe manner.
- .7 Do not disrupt active or energized utilities designated to remain undisturbed.
- .8 Roofing Replacement:
  - .1 Place warning signs on electrical lines and equipment that must remain energised to serve the property during periods of demolition.
  - .2 Designated mechanical services shall be disconnected in accordance with the requirements of the local authority having jurisdiction.
  - .3 Active or energised utilities designated to remain undisturbed shall not be disrupted.
  - .4 Place warning signs at strategic points around the building noting " Caution Men Working Overhead ".
  - .5 Tape off all areas which pose a danger to the public.

## 3.2 Existing services

- .1 Arrange with utility companies for locating utilities and service lines and for disconnection of existing services owned by utility companies and which will be disconnected by said utility companies, provided such services do not interfere with occupied building areas.
- .2 Disconnect all electrical, telephone service lines and other utility lines in the areas to be demolished. Post warning signs on all electrical lines and equipment that must remain energized to serve other areas during period of demolition. Disconnect and re-route electrical and telephone service lines in demolition areas to the requirements of local authority having jurisdiction.



- .3 Disconnect and cap all mechanical services in accordance with requirements of local authority having jurisdiction.
- .4 Where unknown services are encountered, immediately advise Consultant and Project Manager and confirm findings in writing.
- .5 Record locations of maintained, rerouted and abandoned service lines on project record documents in accordance with section 01 78 00.
- .6 Remove sewer and water lines where required within existing building as deemed necessary, and cap to prevent leakage, in accordance with authorities having jurisdiction.
- .7 Roofing replacement scope of work (Existing Roof Mounted Equipment):
  - .1 Unless noted otherwise, the Contractor shall be responsible for completely disconnecting and removing mechanical and electrical equipment and fixtures and any other items that would interfere with the carrying out of the roofing and all related work as specified. The Contractor shall also be responsible for reinstalling and reconnecting all such equipment and other items upon completion of the work.
  - .2 This work shall be done only by workers skilled in the respective trades involved. All equipment shall be stored in an approved location and safe from damages or contamination. Protect all openings from weather. All breakers controlling electrical circuits for roof mounted equipment must be turned off and tagged before disconnecting equipment. A warning tag and lock shall be installed on the disconnect for the equipment to ensure that the equipment remains de-energised.
  - .3 Using materials to match the existing, modify all ductwork, mechanical and electrical connections, etc. to the roof mounted equipment as necessary to accommodate the change in height of the curbs and sleepers. Supply and install all new collars and sleeves.
  - .4 Raise all equipment to provide a minimum curb height of 10 in..
  - .5 Reinstall all equipment to the satisfaction of the Owner all electrical equipment and gas piping if required. All equipment shall be left in proper operating condition or in the same condition prior to the start of the work under this Contract. Restart and test all equipment to the satisfaction of the Owner.

## 3.3 Demolition and removals

.1 Carry out demolition in accordance with the requirements of CSA S350-M.

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- .2 Ensure continuous operation in Owner's building.
- .3 Remove all items and/or finishes designated for removal on the plans as well as any additional unlisted objects not specifically indicated but inferred from the Drawings, the Specifications, and examination of the project site.
  - .1 Remove and store securely items to be re-used.
  - .2 Demolish and dispose of concrete debris.
  - .3 Remove and dispose of steel beams.
  - .4 Demolition work related to roofing replacement:
    - .1 Demolish parts of building to permit construction of remedial work as indicated.
    - .2 Remove existing equipment, services and obstacles where required for refinishing or make good of existing surfaces and replace as work progresses.
    - .3 At end of each day's Work, leave Work in safe condition. Protect interior of building from damage at all times.
    - .4 Do not sell or burn materials on site.
    - .5 Remove contaminated or dangerous materials from site and dispose in a safe manner to minimise danger at site or during disposal.
    - .6 Remove and dispose of all asphalt, felts, gravel forming the roof assembly on roof J where insulation is marked as wet only.
    - .7 Remove and dispose of all sheet metal flashing forming the roof assembly.
    - .8 Remove all insulation and keep for reuse.
    - .9 Remove and dispose of all roof membrane.
    - .10 Remove and dispose of all rotten wood blocking.
    - .11 Remove and dispose of all existing vent stack cones.
    - .12 Keep all ballast for reuse.
    - .13 Remove and dispose of redundant roof curbs as designated by the Consultant.
    - .14 Disposal of all materials shall be in accordance with the requirements of the authorities having jurisdiction, unless otherwise directed in writing by the Consultant.

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- .5 Execute work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.
- .4 Continuously remove demolished materials from the construction area as they accumulate, in order to ensure no hazard condition is left during non-working hours and that full measures are taken by sprinkling and other means to keep dust to a minimum.
- .5 Carefully remove in re-usable condition, transport and store on site where directed by Owner's Project Manager and protect against damage all materials and equipment to be salvaged or relocated for reuse in the new work as directed by Owner's Project Manager.
- .6 Join and make good new work to existing in such a manner that the joint is structurally sound and inconspicuous.
- .7 Maintain the existing building in a weather and watertight condition at all times.
- .8 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as Work progresses.
- .9 At the end of day's Work, leave Work in safe condition with no dirt in danger of toppling or failing. Protect interiors of parts not to be demolished from exterior elements.
- .10 Upon completion of demolition, leave interior surfaces broom clean.

## 3.4 Cutting and patching

- .1 Perform cutting, fitting, and patching to complete the Work. Do not cut, drill or sleeve load-bearing members without obtaining written approval from Consultant for each condition.
- .2 Remove and replace defective and non-conforming work.
- .3 Perform work to avoid damage to other work.
- .4 Prepare proper surfaces to receive patching and finishing.
- .5 Restore work with new products to match existing in accordance with Contract Documents.
- .6 Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .7 At penetration of fire rated wall, floor construction, completely seal voids with fire rated material, full thickness of construction element.



.8 Refinish surfaces to match adjacent finishes; for continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

## 3.5 Disposal

- .1 Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- .2 All resulting materials and by -product from demolition shall be disposed to an approved waste disposal facility.
- .3 Burning of materials on site is not permitted.

## 3.6 Restoration

- .1 Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to conditions existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.
- .2 Restore to its original condition any portion of the building demolished unnecessarily, at no expense to the Owner.
- .3 Immediately as the work progresses, repair all vibration and excavation damages to existing adjacent properties and active underground services.
- .4 Where penetrations through existing walls or floors result from removal or relocation of existing services or equipment, repair to standard of construction of surrounding material except where otherwise indicated.
- .5 Conceal pipes, ducts and wiring in floor, and wall construction of finished areas except where otherwise indicated.

## 3.7 Cleaning and waste management

- .1 Comply with requirements of Section 01 74 00.
- .2 Maintain progressive cleaning of work site and surrounding areas during demolition.
- .3 Comply with Provincial and local fire and safety laws, ordinances, codes, and regulations.
- .4 Vacuum clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations. Continue vacuum cleaning on an as-needed basis until renovations are ready for occupancy.

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.5 \ e	When work is substantially performed, remove remaining waste equipment, machinery and surplus materials not required for per remaining work.	materials, tools, formance of
.6 F	Provide final cleaning in accordance with Section 01 74 00 and A and leave work clean and suitable for occupancy	ASTM E1971

## End of Section

### 1 General

#### 1.1 Section Included

- .1 Concrete repair of roof deck soffit and roof deck top surface.
- .2 Provide all materials, labour and equipment as necessary to complete the repair work for concrete delaminations, spalls, scaling and rough surface treatment and structurally damaged concrete surfaces as described herein, including location and removal of deteriorated concrete, formwork, shoring, protection, preparation, reinforcement, supply and placement of all concrete materials, finishing and curing. Depth of repairs shall be adequate to restore concrete to original dimensions after proper preparation to sound concrete.

#### 1.2 Related Work

- .1 Work performed by other Sections which is related and to be co-ordinated with this Section is specified in:
  - .1 Section 02 41 19: Rehabilitation of cast-in-place concrete
  - .2 Section 03 30 00: Cast-in-Place Concrete

#### **1.3 Standards and References**

.1 All concrete and reinforcing steel work shall conform to the requirements of CAN/CSA-A23.1-09 and CAN/CSA-A23.2-09.

#### **1.4** Shoring, Formwork and Protection

- .1 Reinforced concrete slabs shall be adequately supported for the Contractor's equipment and operations.
- .2 Shore all structural elements prior to commencing removal of deteriorated concrete. The integrity of the existing structure must be maintained at all times during the course of the work. Provide formwork as required.

#### **1.5 Qualifications of Contractor**

.1 Work under this Section shall be done only by a recognized established Contractor, having at least 5 years of proven satisfactory experience and who has skilled mechanics, thoroughly trained and competent in carrying out the work specified.



## 2 Products

## 2.1 Polymer Modified Mortar:

	Application				Minimum Compressive Strength @ 28 days
Manufacturer	Soffit/Vertical Repair		Top Repair		
Manufacturer	Thickness (t) < 25 mm	t >25mm & 75mm ( w/ Aggregate Extension)	t < 25 mm	t>25mm & 75mm ( w/ Aggregate Extension)	
ΜΑΡΕΙ	Planitop X Repair Mortar		Planitop 18		50Mpa
		Planitop FD		Planitop 18	45 Mpa
GIKA	SikaTop 123 Plus		SikaTop 122 Plus		50Mpa
5		SikaTop 111 Plus		SikaTop 111 Plus	55Mpa
			Master Emaco T310 C1	MasterEmaco T310 C1	52 Mpa
BASF	Master Emaco N425				46 Mpa
		Master Emaco N400 (Pre- extended)			40 Mpa

## 2.2 Curing Product:

- .1 Curing compound shall be compatible to:
  - .1 Repair mortar per manufacturer's recommendation.
  - .2 Waterproofing membrane per membrane manufacturer's commendation.
- .1 Primer/bonding agent/ corrosion inhibitor:
  - .1 Follow manufacturer's recommendation to use primer/bonding agent/corrosion inhibitor.
    - .1 Acceptable Products:

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	.1	Planibond 3C corrosion inhibitor by MAPEI.
	.2	SikaTop Armatec 110 EpoCem priming (bonding agent) by Sika Construction Product
	.3	SikaFerrogard 901 corrosion inhibitor by Sika Construction

#### 2.3 Ready-Mix Concrete

.1 Ready-mix concrete shall have a 28-day strength of minimum 35 MPa with the maximum size of course aggregate limited to 10 mm for partial depth ( for full depth repair maximum aggregate size is 20 mm).

Product. (Consult manufacturer to ensure compatibility)

.2 Refer to section 03 30 00.

### 2.4 Crack and Joint Sealant

- .1 Colour of sealant shall match existing substrate as closely as possible.
- .2 All materials, including primer, bond breaker tape, backer rod and cleaning materials, shall be supplied by and used in strict accordance with the Manufacturer's current printed instructions.
- .3 Acceptable materials:
  - .1 Sikaflex 2c: NS by Sika Construction Product.

#### 2.5 Aggregate for polymer modified concrete:

- .1 Aggregate shall conform to ASTM C-33.
- .2 Aggregate shall be cleaned, well-graded, saturated surface dry aggregate, having low absorption and high density.
- .3 Follow manufacturer's recommendation for use of aggregates.

## 2.6 Field-Applied Epoxy Coating

- .1 Field-applied epoxy coating for existing reinforcing steel shall be a 100% solids epoxy coating, as approved by Consultant.
  - .1 Approved product:
    - .1 Tammsbar rebar epoxy coating by Euclid chemicals or approved equivalent.
- .2 Refer to section 03 21 00 for new reinforcement specifications.

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## 3 Execution

## 3.1 Examination

.1 Prior to commencement of concrete repairs, review proposed work with the Consultant as to methods of locating deteriorated concrete, removing concrete, cleaning steel, preparing substrate, patching, and measuring quantities of work. so as to be fully aware of the procedures to be used and the scope of work.

## 3.2 **Preparatory work**

.1 Prior to commencement of concrete repairs, clean all concrete surfaces, as necessary, to present a clean, intact concrete surface, free of deleterious material. Blow clean, using oil free compressed air.

## 3.3 Location and determination of unsound areas

- .1 The Contractor shall, prior to removal, sound all concrete surfaces and mark the outline of all defective, unsound, or deteriorated concrete areas to be repaired. The marking shall be in a contrasting colour to that of the concrete.
- .2 The Contractor shall verify all areas of repair and/or removal with the Consultant prior to commencing removal.

## 3.4 Removal

- .1 Provide temporary shoring.
- .2 Concrete shall be removed using demolition or chipping hammers. Areas of defective concrete shall be removed down to a level of sound concrete, regardless of the depth encountered. Care shall be exercised so as not to injure, cut, or otherwise damage the reinforcing steel or the surrounding sound areas.
- .3 Any damage caused by the Contractor to any part of the structure outside the repair area shall be repaired by the Contractor at no cost to the Owner and to the satisfaction of the Consultant.
- .4 Chipping hammer shall not exceed 7 kg in size and shall not be operated closer than 3 m to each other.
- .5 Saw cut the perimeters of all repair patches to provide a vertical/horizontal edge to a depth of not less than 12 mm. Do not overcut and do not cut steel. Feathered edges will not be acceptable. Any damage caused by the Contractor

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to any portion of the structure not intended for repair shall be repaired by the Contractor, at the Contractor's own expenses.

- .6 All areas of prepared substrate shall be reviewed with Consultant prior to placement of concrete.
- .7 Typical minimum depth of concrete removal shall be 50 mm measured from the concrete surface. Contractor to consult manufacture for required minimum depth of concrete removal suitable for selected concrete repair materials.
- .8 Where reinforcing steel is encountered, extend the concrete removal around the reinforcing steel, so that there is a 25 mm minimum clearance between the steel and sound concrete. Care should be taken not to vibrate the reinforcement or otherwise cause damage to its bond to concrete adjacent to the repair area.
- .9 Concrete removal shall extend along the bars to location along the bar free of bond inhibiting corrosion, and where the bar is well bonded to the surrounding concrete.

## 3.5 Reinforcing Steel

- .1 Perform reinforcing steel preparation in accordance with ICRI Technical Guidelines #03730.
- .2 Sandblast all exposed reinforcing bars clean to a "near-white" finish.
- .3 All excessively corroded or damaged reinforcing steel bars shall be replaced or reinforced as directed by the Consultant. When exposed reinforcing bars designated to remain in place have lost more than 15% of their original cross-sectional area due to corrosion or damage, reinforce or replace with new reinforcing as directed.
- .4 An additional length of uncorroded bar will have to be exposed if lap splices or welding are to be used for replacement reinforcement.
- .5 New reinforcing steel bars shall be free of rust, grease, oil, and any other deleterious materials and shall conform to CSA Standard CSA G30.18-09, Grade 400W (if rebars to be welded) re-bars and tie wires. Use plastic chair supports.
- .6 Reinforcing shall be by lapping or welding new matching reinforcing bars to the existing reinforcing bars.
- .7 A welded connection, if used, shall require submittal by the Contractor and approval by the Consultant of a welding procedure along with the test results to

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demonstrate the strength of the welded joint and metallurgical compatibility of the weld material with the reinforcing steel.

## 3.6 Surface preparation

- .1 Remove all deteriorated concrete, dirt, oil, grease or other bond inhibiting materials from surface by using sand blasting or other manufacturer approved mechanical means.
- .2 Obtain substrate aggregate fracture as per Concrete Surface Preparation (CSP 6-9) and as per manufacturer's recommendation.

## 3.7 Placing Concrete

- .1 Minor Patch Repairs:
  - .1 Placement Procedures
    - .1 Pre-wet concrete surfaces before placing repair materials. Concrete surfaces receiving repair materials should be Saturated Surface -Dry (SSD). An SSD condition is achieved when the body of the concrete is saturated and free surface water and puddles have been removed from the surface of the concrete.
    - .2 Do not wet the surface immediately before placing material which will result in poor bond between the repair material and the concrete substrate.
  - .2 Bonding Agent:
    - .1 Wet all surfaces of concrete repair 4 hours immediately prior to placing the bonding agent.
    - .2 Coat all surfaces of concrete repair, reinforcing steel, and miscellaneous steel items with bonding agent immediately prior to placing the concrete repair materials.
    - .3 Bonding agent shall be compatible with the type of polymer modified mortar used and shall be placed in strict accordance with the manufacturer's instructions.
    - A list of the products to be used, complete with technical data and a copy of the Manufacturer's instructions/ recommendations, shall be supplied to the Consultant prior to the construction start-up. Deviation from the list of products submitted shall not be permitted without the written consent of the Consultant.

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- .3 Concrete Repair Material:
  - .1 Concrete repair material is to be polymer modified mortar or polymer modified concrete, used in strict accordance with the Manufacturer's recommendations.
  - .2 A list of the products to be used, complete with technical data and a copy of the Manufacturer's instructions/ recommendations, shall be supplied to the Consultant prior to the construction start-up. Deviation from the list of products submitted shall not be permitted without the written consent of the Consultant
- .4 Concrete Placing
  - .1 Place repair material into the prepared cavity.
  - .2 Consolidate the repair material into the cavity using either a vibrating screed or internal vibrator to allow the repair material to flow around the reinforcing steel and also come into intimated contact with the exiting concrete substrate.

## 3.8 Finishing Concrete

- .1 Finish and cure concrete as per the manufacturer's recommendation for the selected repair material.
- .2 Curing must commence immediately after placing and finishing repair materials and curing must be provided by recognized curing methods such as wet burlap covered with white polyetheline film over the repair areas for a minimum of 7 days. or approved curing compounds.
- .3 Use curing compounds compatible to selected concrete repair material and as per manufacturer' strict recommendations.
- .4 Formwork may be removed in minimum 7 days of placing concrete subject to Contractor provide concrete compressive test proving that concrete has attained 75% of specified compressive strength at 28 days. The cost for these concrete test shall not be paid by the Owner.

## 3.9 Related Repairs

- .1 Crack Repair and Joint Sealing:
  - .1 Where repairs are required to cracks in concrete rout out with saw grinder to a minimum 6 mm wide x 12 mm deep (Width/depth ratio = 2:1).

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- .2 Clean cracks to remove debris.
- .3 Prime, install bond breaker tape, and seal.
- .4 Where joints in concrete are to be sealed, clean out the full depth of the joint, prime, install backer rod, and seal.
- .5 Thoroughly clean all surfaces of contaminants which may affect the performance of the caulking.
- .6 Apply in strict accordance with Manufacturer's instructions.
- .7 Install masking tape along joints to prevent staining of surrounding areas. Any stains shall be immediately removed prior to installation of caulking
- .8 Tool joint to concave profile set about 1.8 mm below the top of slab surface in traffic bearing areas. All other joints to be finished smooth.
- .9 Thoroughly clean all adjacent surfaces of all traces of caulking, smears, primer, etc. on completion of work.
- .2 Rough or Scarified Surface Repair:
  - .1 Where a concrete surface is determined to be excessively rough or scarified, the Contractor shall thoroughly clean the surface and apply a repair material approved by the Consultant.
- .3 Field-Applied Epoxy Coating:
  - .1 Ensure all reinforcing steel to receive coating has been cleaned to a "near-white" finish.
  - .2 Apply in strict accordance with Manufacturer's instructions to a thick, uniform thickness. Reinforcing steel must be completely dry and free of dust, and ambient humidity not greater than 80%.

## 3.10 Field Quality Control

- .1 Testing of Concrete Repairs:
  - .1 Testing by an CCIL-certified testing agency shall be carried out.
  - .2 Concrete testing will include, but will not necessarily be limited to,:
    - .1 A standard compressive strength test for each 15 m<sup>3</sup> of concrete placed but not less than one test for concrete placed each day. Each strength test sample will consist of three cylinders with proper identification and field data. One specimen will be tested at 7 days and two at 28 days.
  - .2 Cylinders will be stored in metal lined curing boxes at a temperature of +10 degrees Celsius until shipped to the testing laboratory.

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	Compressive strength test specimens will be taken in accordance with CSA A23.2-3C. One standard air entertainment test for each standard strength test in accordance with CSA A23.2-4C.
.3	One or more standard slump tests with each standard strength test in accordance with A23.2-5C.
.4	Tensile capacity tests perpendicular to the plane of the interface. Tests subsequent to any failure shall be paid for by the Contractor. Bond strength shall be 1.00 MPa (145 psi) minimum.
End of Section	

### 1 General

#### 1.1 Section includes

.1 Concrete repair of roof deck soffit and roof deck top surface

#### 1.2 Related requirements

- .1 Section 02 41 19 Selective demolition.
- .2 Section 03 01 30.71 Rehabilitation of cast-in-place concrete.
- .3 Section 07 55 00 Inverted Modified Bitumen Roofing.

#### **1.3 Standards and references**

- .1 Abbreviations and Acronyms
  - .1 GU General Use Portland Cement.
- .2 Reference Standards
  - .1 ASTM International(Current Version)
    - .1 ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
    - .2 ASTM C494/C494M-10a, Standard Specification for Chemical Admixtures for Concrete.
    - .3 ASTM C1017/C1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
    - .4 ASTM A82/A82M, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
  - .2 CSA International (Current Version)
    - .1 CSA-A23.1/A23.2Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
    - .2 CAN/CSA-A23.3, Design of Concrete Structures.
    - .3 CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
    - .4 CSA-G30.18, Carbon Steel Bars for Concrete Reinforcement

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- .5 CSA G30.18-09, Welded Steel Wire Fabric for Concrete Reinforcement
- .6 CSA-A283-06, Qualification Code for Concrete Testing Laboratories.
- .7 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .3 Standards and Best Practices by RMCAO, Ready Mixed Concrete Association of Ontario.
- .4 Current version of Reinforcing Steel Institute of Canada (RSIC):
  - .1 RSIC, Reinforcing Steel Manual of Standard Practice.

## 1.4 ACRONYMS AND TYPES

- .1 Cement: hydraulic cement or blended hydraulic cement (XXb where b denotes blended).
  - .1 Type GU or GUb General use cement.

## 1.5 Submittals

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

## **1.6 Source Quality Control**

.1 Have all concrete produced and delivered by a ready-mix plant that is a member of the RMCAO, (Ready Mixed Concrete Association of Ontario) and holds a current "Certificate of Ready Mixed Concrete Production Facilities" issued by the Association. Submit a copy of this certificate to the Consultant for approval.

## 1.7 QUALITY ASSURANCE

- .1 Minimum 4 weeks prior to starting concrete work, submit proposed quality control procedures in accordance with Section 01 45 00 Quality Control for Consultant's approval for following items:
  - .1 Hot weather concrete.
  - .2 Cold weather concrete.
  - .3 Curing.
  - .4 Finishes.



- .5 Formwork removal.
- .6 Joints.

#### 1.8 Delivery, storage and handling

- .1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.
- .2 Do not modify maximum time limit without receipt of prior written agreement from the Consultant and concrete producer as described in CSA-A23.1/A23.2.
- .3 Deviations to be submitted for review by Consultant.
- .4 Concrete delivery: ensure continuous concrete delivery from plant meets CSA-A23.1/A23.2.
- .5 Waste Management and Disposal:
  - .1 Unused admixtures and additive materials must not be disposed of into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

#### 1.9 Site Conditions

- .1 Placing concrete during rain or weather events that could damage concrete is prohibited.
- .2 Protect newly placed concrete from rain or weather events in accordance with CSA A23.1/A23.2.
- .3 Protect from drying.

## 2 Products

#### 2.1 Material

- .1 Portland cement: to CSA-A3001, Type GU unless noted otherwise.
- .2 Water: to CSA-A23.1.
- .3 Aggregates: to CSA-A23.1.
- .4 Coarse aggregates to be normal density to CSA-A23.1/A23.2.
- .5 Reinforcing Steel: deformed steel shall confirm to CSA Standard G30.18, Grade 400.
- .6 Welded steel wire fabric: to CSA G30.15.

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- .7 Chairs, bolsters, bar supports, spacers: to CAN/CSA A23.1.
- .8 Plain round bars: to CAN/CSA G40.21.
- .9 Cold-drawn annealed steel wire ties: to CSA G30.3
- .10 Admixtures:
  - .1 Air entraining admixture: to ASTM C260.
  - .2 Chemical admixture: to ASTM C494 or ASTM C1017. Do not use admixtures containing chlorides.
- .11 Curing compound: to CSA-A23.1/A23.2.
- .12 Curing compound: to CSA A23.1 or to ASTM C309, Type 1-D with fugitive dye.
- .13 Anchor bolts: to ASTM F1554, Grade 36.

## 2.2 Concrete mixes

- .1 Alternative 1 Performance Method for specifying concrete to meet Consultant's performance criteria to CSA-A23.1/A23.2.
- .2 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance to the Consultant.
- .3 Provide concrete mix to meet following hard state requirements:
  - .1 Exterior concrete slab-on-grade: 35 MPa
    - .1 Durability and class of exposure: C-1.
    - .2 Cement:
      - .1 Type GU Portland cement.
    - .3 Minimum compressive strength at 28 days: 35 MPa.
    - .4 Minimum cement content: 300 kg/m<sup>3</sup> of concrete.
    - .5 Maximum water/cement ration: 0.40.
    - .6 Nominal size of coarse aggregate size: 20 mm
    - .7 Slump at time and point of discharge: 80 mm at time of deposit ± 30 mm.
    - .8 Air entrainment: 5 % to 8 %.
    - .9 Chemical admixtures: admixtures in accordance with ASTM C494.
    - .10 Curing: CSA A23.1 basic (3 days at ≥ 10 °C to attain 40% of specified strength).



## 3 Execution

#### 3.1 Preparation

- .1 Obtain Consultant's approval before placing concrete. Provide two (2) working days notice prior to placing of concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 Concrete Reinforcing.
- .3 Pumping of concrete is permitted only after approval of equipment and mix.
- .4 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .5 Prior to placing of concrete obtain Consultant's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .6 Protect previous Work from staining.
- .7 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .8 Do not place load upon new concrete until authorized by Consultant.
- .9 Ensure concrete delivery and handling facilitates placing with minimum of rehandling, and without damage to existing structure or work.

#### 3.2 Construction

- .1 Do cast-in-place concrete work in accordance with CSA-A23.1/A23.2.
- .2 Sleeves and inserts.
  - .1 Where approved by Consultant, set sleeves, ties, and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 x 100 mm not indicated, must be approved by Consultant.
  - .2 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Consultant before placing of concrete.
  - .3 Check locations and sizes of sleeves and openings shown on drawings.
  - .4 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.
  - .5 Core-drilling/cutting:
    - .1 Core-drilling/cutting of holes in any concrete element is not permitted without written consent from the Consultant. All



## **Cast-in-Place Concrete**

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proposed core-drilling/cutting must be submitted to the Consultant for review prior to execution of work. Request for core- drilling/ cutting must have 72 hours notice to allow Consultant time to review proposed locations.

- .3 Anchor bolts.
  - .1 Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.
  - .2 With approval of Consultant, grout anchor bolts in preformed holes or holes drilled after concrete has set. Formed holes to be minimum 100 mm diameter. Drilled holes to be manufacturer's recommendations.
  - .3 Set bolts and fill holes with shrinkage compensating grout.
  - .4 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100 % contact over grouted area.

## 3.3 Temperature control

- .1 Temperatures referred to are ambient air temperatures in the shade.
- .2 Extreme rapid or severe drying conditions are those conditions when the rate of evaporation of surface moisture from the concrete exceeds 0.7 kg/m2/hr.
- .3 Insulation materials mean wood fibre, mineral wool, glass fibre, plastic foam or other suitable material, having a thermal conductivity (k) not exceeding 0.038 W/M/1°C per 25 mm. of thickness.
- .4 Cold weather means those conditions when the air temperature is at or below 5 °C or when the air temperature is likely to fall below 5 °C within 24 hours.
- .5 Hot weather means those conditions when the air temperature is at or above 27 °C or when the air temperature is likely to rise above 27 °C within 24 hours.

## 3.4 Cold weather concreting

- .1 Provide temporary plant and equipment for heating concrete materials and forms. Protect, insulate and maintain the proper temperature and humidity of the concrete during curing in compliance with CSA-A23.1.
- .2 Equipment shall be available, installed and tested ready for use at least 1 week before it is proposed to produce heated concrete.
- .3 Where the specified concrete temperature is achieved by pre-heating, the concrete materials before batching shall not exceed 65 °C.

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.4	Water o	over 40 °C s	hall not be b	rought into	direct contact wit	h the cement.
.5	Frozen l heating without	lumps of ag aggregate s local hot sp	gregate sha stockpiles sh ots.	ll not be add nall be such	ded to the concre as to produce ur	te. The method of iform conditions
.6	The con 30 °C.	ncrete temp	erature at the	e time of pla	acing shall be bet	ween 10 °C and
.7	Cold we	eather conci e payment v	eting shall b will be made	e inclusive	to the price quote	ed and no further or
.8	Cover, p	protect and	insulate all e	exposed cor	ncrete.	
.9	When fr heat by existing	resh concre extending t	te is to be ca he protectior	ast against e n for the fre	existing concrete, sh concrete at lea	prevent the loss of ast 600 mm over the
.10	Insulate metal w	e or enclose /hich project	within the pr is from the c	rotective ho oncrete bei	using, tie rods, re ng protected.	inforcement or
.11	Dispose Avoid hi	e heating un igh tempera	its to avoid h ture and dry	heating con heating wit	crete locally or dr hin enclosures.	ying it excessively.
3.5 Hot w	veather c	concreting				
.1	The max	ximum cono	crete temper	ature at the	time of placing s	hall be:35 °C.
.2	Protect	and cure in	accordance	with Sectio	n 21 of CSA-A23	.1.
.3	Hot wea separate	ather concre	eting will be i will be made	nclusive to	the price quoted	and no further or
.4	Concret	te placed ur perature rar	nder normal f nge of 10 °C	temperature and 30 °C.	e conditions shall	be deposited within
3.6 Placi	ng concr	rete				
.1	Place co	oncrete as s	specified in C	CSA- A23.1		
.2	Inform C	Consultant a	at least 48 ho	ours before	each concrete pla	acing operation.
.3	Do not p concrete	place concre e is placed,	ete when it is protect with	s raining or waterproof	likely to rain. If ra covers until set.	in begins after
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- .5 For exposed concrete, take special precautions when placing to prevent segregation of concrete, and to avoid cold joints, honeycombing or voids. Do not allow vibrator to touch formwork.
- .6 Use form vibrators only when sections are too narrow for internal type. Employ a sufficient number of vibrators to ensure complete consolidation of concrete throughout entire volume of each layer.
- .7 Have available at least one extra vibrator on hand for emergency.
- .8 Do not use vibrators for the use of moving concrete.
- .9 Use only tools and handling equipment that are clear of rust or other harmful and foreign material to avoid efflorescence and staining of slabs or hardened concrete.
- .10 Use concrete pumps to place concrete only with approval of methods, equipment and mix design.
- .11 Provide continuous supervision during placement of concrete including concrete grout to ensure reinforcing steel is maintained in correct position.
- .12 During concreting operations:
  - .1 Development of cold joints not allowed.
  - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling and without damage to existing structure or Work.
- .13 Grout where indicated using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.
- .14 Concrete shall be homogeneous, uniformly workable, readily placeable into corners and angles of forms and around reinforcements without permitting materials to segregate or excessive free water to collect on the surface.
- .15 Deposit concrete as close as possible to its final position. Lateral movement of concrete shall be avoided. When concrete is to be dropped more than 1.5 m in height, fully enclosed vertical drop chutes shall be used.
- .16 Concrete placing shall proceed as a continuous operation until the full section planned for concreting has been completed.
- .17 Compact concrete with general purpose vibrators so that concrete is evenly and adequately distributed around and between reinforcing and against formwork, without honeycombing. Vibrators shall not be used in a manner which will



cause segregation of the plastic concrete mix. External vibrating of forms is not permitted.

- .18 Ensure reinforcement, anchor bolts and inserts are not disturbed during concrete placement.
- .19 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .20 Do not place load upon new concrete until concrete has attained sufficient strength to sustain loads without damage and not until authorized by Consultant.
- .21 Concrete protective cover to reinforcement as noted on the drawings.
- .22 Accurately support bars on plastic coated steel chairs to maintain exact cover requirements

### 3.7 **Protection of completed work**

.1 At all times during the Work, protect exposed concrete, and other exposed members from staining or becoming coated with concrete leakage due to continuing concreting operations. Members which become coated may be classed as defective work by the Consultant.

#### 3.8 Site tolerance

.1 Concrete slab tolerances in accordance with CSA-A23.1/A23.2, F-number Method, FF =25, FL = 20.

## 3.9 Curing

- .1 Protect and cure in accordance with Section 21 of CSA-A23.1.
- .2 Cure horizontal surfaces by covering with polyethylene sheets with edges taped for at least 4 days. Lap edges 100 mm minimum
- .3 It is the Contractor's responsibility to take all additional and necessary procedures and precautions to ensure the proper curing of the concrete.
- .4 Immediately after placing concrete cure all deck surfaces using a layer of polyethylene placed immediately over wet burlap. Keep the burlap wet at all times. Keep covered for a minimum of 7 days and until a compressive strength of 27 MPa is attained.



## 3.10 Finishing

- .1 Finish concrete floor to meet requirements of CSA-A23.1/A23.2.
- .2 Use smooth form finish for all formed concrete surfaces. Use form facing material that will produce a smooth, hard, uniform texture on the concrete. Do not use material with raised grain, torn surfaces, worn edges, patches, dents or other defects that will impair the texture of the concrete surface. Patch the holes and defects. Completely remove fins.
- .3 Use procedures acceptable to Consultant or those noted in CSA-A23.1/A23.2, to remove excess bleed water. Ensure surface is not damaged.
- .4 Wet cure using polyethylene sheets placed over sufficiently hardened concrete to prevent damage. Overlap adjacent edges 150 mm and tightly seal with sand on wood planks. Weigh sheets down to maintain close contact with concrete during the entire curing period.
- .5 Where burlap is used for moist curing, place two pre-wetted layers on concrete surface and keep continuously wet during curing period.
- .6 Concrete floor to have finish hardness equal or greater than Mohs hardness in accordance with CSA-A23.1/A23.2.
- .7 Rub exposed sharp edges of concrete with carborundum to produce 3 mm radius edges unless otherwise indicated.

## 3.11 Field quality control

- .1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Consultant in accordance with CSA-A23.1/A23.2, and Section 01 45 00 Quality Control.
- .2 For compressive strength testing of concrete a minimum of four (4) cylinders and three (3) field cured cylinders are required for:
  - .1 Each day's pour.
  - .2 Each type of grade of concrete.
  - .3 Each 50 cubic meters or fraction thereof for footings and foundation walls, requirements of CAN/CSA A 23.1.
- .3 Conduct at least one (1) slump and one (1) air entrainment test with each compressive strength test.
- .4 Pay for costs of tests as specified from Cash Allowance. Costs of retesting due to deficient work will be paid for by Contractor.

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- .5 Take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .6 Non-destructive Methods for Testing Concrete shall be in accordance with CSA-A23.1/A23.2.
- .7 Provide Certificate of Field Quality Inspection and Testing to Owner's Representative for inclusion in Commissioning Manual.
- .8 Inspection or testing by Owner's Representative will not augment or replace Contractor quality control nor relieve the Contractor of his contractual responsibility.

## 3.12 Defective work

- .1 Repairs and classification of unacceptable concrete to be in accordance with CAN/CSA-A23.1.
- .2 Remove defective concrete and embedded debris and repair as directed by Owner's Representative.
- .3 Remove to bare concrete curing compounds detrimental to application of specified finishes.
- .4 Concrete to be supplied at the minimum strength requirement at 28 days. Tests indicating strengths lower than specified will necessitate further testing as required by the Owner's Representative. Cost for such testing to be at the Contractor's expense. Should further tests confirm low values, the Owner's Representative has the right to require strengthening of the affected area or removal and replacing of the weak concrete all to the Contractor's expense.
- .5 Repair all shrinkage cracks in the completed slab-on-grade to remain exposed employing a suitable epoxy injection technique acceptable to Owner's Representative to completely seal all such cracks, all to the Contractor's expense.
- .6 In the event that the post-finishing survey shows that the concrete surface does not meet the specified tolerances, take corrective action within five (5) working days, or as directed by the Consultant.
- .7 Submit proposed corrective action in writing, with complete details of methods, tools, and materials for the Consultant's approval. Upon acceptance of the proposed method, a test area is to be prepared, and upon acceptance, will be the standard for the remainder of the repairs.



.8 Grind down high points to a smooth surface conforming to the specifications and with a surface finish equal to the remainder. If cutting or chipping by hammer is required at high areas, obtain written approval of repair procedure from Consultant before starting repairs.

## 3.13 Clean up

- .1 Do not unload excess concrete from trucks during clean-up operations and do not deposit in undesignated or unauthorized locations within the property boundaries whether concealed or not.
- .2 Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by Consultant.
- .3 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.
- .4 Using appropriate safety precautions, collect liquid or solidify liquid with inert, non combustible material and remove for disposal.
- .5 Dispose of waste in accordance with applicable local, Provincial and National regulations.

## End of Section

#### 1 General

#### **1.1 Section Include**

- .1 New steel beams supporting new cooling tower.
- .2 Localized repair of HSS members at steel enclosure at cooling tower.

#### 1.2 Related Work:

.1 Section 02 41 19 Selective Demolition.

### 1.3 Reference Standards:

- .1 CSA G40.20-13/G40.21-13: General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel
- .2 CSA S16-09, Design of Steel Structures
- .3 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel
- .4 CSA W48-06 (R2011), Filler Metals and Allied Materials for Metal Arc Welding
- .5 CSA W59-03 (R2008), Welded Steel Construction (Metal Arc Welding)
- .6 CSA W178.1-08, Certification of Welding Inspection Organizations
- .7 CSA W178.2-08, Certification of Welding Inspections
- .8 CAN/CGSB-1-GP171-98, Inorganic Zinc Coating
- .9 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating
- .10 CISC/CPMA 1-73a (latest edition) A Quick-drying One-coat Paint for Use on Structural Steel
- .11 CISC/CPMA 2-75 (latest edition)- A Quick-drying Primer for Use on Structural Steel.

#### 1.4 Quality Control

- .1 Installation Requirements:
  - .1 Ensure proper use of all materials in strict accordance with the Manufacturer's requirements. Work shall be carried out only by skilled workers specifically trained and experienced in this type of work. The Contractor shall provide a full-time, senior, qualified representative on site to direct the work as it progresses at all times.

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- .2 The Contractor shall examine the site to verify quantities, dimensions and physical condition of existing materials, and conditions affecting work.
- .2 Welder Qualifications:
  - .1 Welders shall be certified by the Canadian Welding Bureau to the requirements of CSAW47.1-(latest edition)
  - .2 Weld structural steel components and weld materials to the requirements of CSA W59-(latest edition)
- .3 Requirements of Regulatory Agencies:
  - .1 Conform to the requirements of jurisdictional authorities for installations specified in this Section.
  - .2 Ensure all assemblies, components, fastening points, bolts, welds, etc. are sufficient to withstand loads as required by the governing codes, standards, and authorities having jurisdiction.
  - .3 Do structural steel work to CAN/CSA-S16.1-09.

## 1.5 Site Conditions

- .1 Examination of Site:
  - .1 The Contractor shall examine the site and take measurements to verify all quantities, dimensions, openings and existing physical conditions affecting the work, and for accurate and proper fitting and clearance of obstructions, including those to be installed under other Sections.
  - .2 Environment Requirements:
    - .1 No installation work shall be performed during rainy or inclement weather, or on frost covered or wet surfaces.
  - .3 Safety Requirements:
    - .1 Comply with all safety regulations of authorities having jurisdiction.

## 1.6 Protection

.1 Protect materials, finishes and work under this Section from damage by weather and other causes. Provide protection of any waterproofing being affected, and protect from spillage of grease, oil, and solvents.



- .2 Protect adjacent existing materials and surfaces from damage by work under this Section, and in particular from welding activities.
- .3 Maintain protection of finished fabrication surfaces from time of installation until final clean-up.

## 2 Products

### 2.1 Materials

- .1 Steel shapes: CSA G40.20/G40.21 350 W, CAN/CSA-S16-09
- .2 Steel angle, & plates: CSA G40.20/G40.21 300 W, CAN/CSA-S16-09
- .3 Hot-Dip Galvanized on Iron and Steel: ASTM A123 M 12
- .4 Stainless Steel: to ASTM A167 or A276, type 304 or Type 316,

## 2.2 Fastenings and Anchor Bolts

- .1 High strength bolts, nuts and washers: to ASTM A325M. Type 1 Nuts shall be Heavy Hex in accordance with ASTM A194 Grade 2H or A563 grade DH.
- .2 Machine Bolts: ASTM A307 Grade A,
- .3 Anchor Rods: to CSA G40.20/G40.21 Grade 300 W or ASTM F1554 Grade A36.
- .4 All welding shall conform to CSA W47.1 and CSA W59. Use E70XX electrodes.
- .5 For anchors or fastening required to fix equipment after concrete has been poured, use anchorage in accordance with the equipment Manufacturer's recommendations.
- .6 Provide angles, brackets, inserts, bolts, frames and all other items required to fasten metalwork to concrete, to metal framing or other parts of the structure, as shown on the Drawings.

## 2.3 Corrosion Protection

- .1 Clean and paint all steel.
- .2 Use stainless steel where shown on Drawings.
- .3 Hot dip galvanize all metal items including ferrous metal fixings and miscellaneous parts, hangers, bolts, nuts and washers. Galvanize in accordance with ASTM A123-12.



## 2.4 Fabrication And Repair

- .1 General:
  - .1 Fabricate work to the requirements of authorities having jurisdiction, CAN/CSA-S16.1-09, and as shown on the Drawings. Fabricate components specified in this Section and shown on the Drawings with machinery and tools specifically designed for the intended manufacturing processes and with skilled tradesmen.

## .2 Assembly:

- .1 Accurately cut, machine and fit all joints, corners, copes and miters so that components fit together tightly and in true planes.
- .2 Weld all connections unless otherwise shown on Drawings. Weld all joints continuous for full length, tight, flush, and in true planes with the base metals.
- .3 Where bolting is required, fasten components using concealed methods. Countersink bolts and provide method to prevent loosening of nuts. Ream holes drilled for fastenings.
- .4 Provide for differential movement at junctions of assemblies with surrounding construction.
- .5 Verify weldability of existing structural steel to which new steel is connected by welding. No test sample analysis of the existing steel has been performed.
- .3 Finish Work:
  - .1 After fabrication, thoroughly descale steel components. Grind smooth to true, sharp profiles to achieve level bearings. Grind exposed welds, sharp projections, rough surfaces and irregularities smooth and flush, and clean with a wire brush.
  - .2 Cleanly and smoothly finish exposed edges. Fill open joints, depressions and seams with metallic paste filler or by continuous brazing or welding.
  - .3 Grind and fill welds smooth and flush where exposed to view.
  - .4 All finished work shall be free of defects detrimental to appearance and performance.
  - .5 Shop Galvanizing of Steel:
    - .1 For exterior assemblies, galvanize work after fabrication is complete. Galvanize items occurring on or in an exterior wall or



slab, such as lintels. Thread dimensions such that nuts and bolts will fit without rethreading or changing threads. Clean and prepare surfaces and hot-dip galvanize to ASTM A123-M Galvanized surfaces: GCSB 1-GP-178M, alkyd-type zinc dust/zinc oxide primer.

- .2 Touch-up welds with zinc-rich primer.
- .3 Minimum zinc coating to 710 grams per square meter.
- .4 Include painting of all materials and fittings, including bolts, nuts, and washers.

## 3 Execution

## 3.1 Examination

- .1 Surfaces shall be clean, smooth, firm, dry, and free of surface water, ice, snow, frost, voids, projections, loose material, oil, grease, wax, asphalt, curing compounds and other foreign matter detrimental to the performance of the fabrications. Remove laitent concrete by sandblasting.
- .2 Repair scaling and fill all voids, holes or honeycombed areas and tie holes with cement grout.

## 3.2 Installation

- .1 Do drilling, cutting and fitting necessary to attach work to adjoining components and surfaces and make it complete.
- .2 Make joints tight and smooth; leave completed work straight, true, positioned and anchored securely.
- .3 When anchors, fastenings, or sleeves have to be built-in by other trades, supply necessary templates, instructions and supervision to ensure a satisfactory installation.
- .4 Provide all materials, products, accessories and parts required for anchoring, bolting or welding fabrications to structure. Include all anchor bolts, bolts, washers and nuts, screws, expansion shields, toggles, straps, sleeves, sockets, brackets, clips, and other items necessary for secure installation of fabrications as required.
- .5 Form joints in the field by welding.


- .6 Insulate between dissimilar metals, or between metal and masonry or concrete with bituminous paint to prevent electrolysis.
- .7 Caulk all joints between adjacent materials and metal fabrications installed under this Section. Install anchors as per Manufacturer's instructions and governing codes.

# 3.3 Field Painting

- .1 After installation, grind smooth sharp projections and irregularities, and clean with a wire brush. Remove all oil, grease, loose mill scale, rust, dirt, weld flux and spatter from metal surfaces by wire brush or grinding.
- .2 Immediately after installation, repair areas of bare metal and welds on galvanized surfaces with 2 coats of zinc rich prime paint. Restrict use of prime paint to touch up only; replace galvanized members otherwise damaged. Apply one coat of prime paint to field welds, rivets, bolts and other surfaces not previously primed, and touch-up the shop coat of primed surfaces that are burned, scratched, damaged, abraded or otherwise damaged. Leave ready for finish painting.
- .3 Remove damaged, dented, defaced, defectively finished, or tool marked components and replace with new.

# 3.4 Field Quality Control

# 3.5 Adjustment And Cleaning

- .1 Clean-up:
  - .1 At the end of each day and on completion of the work, clean up and remove from work area all debris, surplus materials and obstructions caused from operations specified under this Section.
  - .2 Clean soiled surfaces, spatters and damage caused by the work.
- .2 Correction of Defects:
  - .1 Remove damaged, dented, defaced, defectively finished, or tool marked components and replace with new.
  - .2 After erection, immediately touch-up areas of bare metal, welds, bolts, and finishes that are burned, cut, scratched, welded, threaded or otherwise damaged as follows:
    - .1 Primed surfaces: prime paint to match shop coat.

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	.2 Galvanized surfaces: zinc-rich paint to a minimum coating of 4
	mils to meet specified requirements of ASTM A780.
.3	Shop applied finishes: repair only after Consultants approval.

## 1 General

## 1.1 Scope of Work

.1 Supply and install new safety railings for roof hatch.

## 1.2 Related Work

- .1 Section 07 55 00 Inverted Modified Bituminous Roofing.
- .2 Section 07 62 00 Metal Flashing.
- .3 Section 07 90 00 Sealant

## 1.3 General

.1 The Contractor shall furnish all labour, materials, equipment, tools and supervision necessary to install safety railing for the roof hatch at 230 The Esplanade and to install safety railings at the perimeter where shown on the roof plan for approximately 69'2" and install new railings adjacent to the new ladder on roof D for 6'6" (2 m) each side or 13'0.

## 1.4 References

## 1.5 Submittals

- .1 Submit copies of manufacturer product data sheets on each product to be used.
- .2 Submit manufacturer installation instructions and recommendations.
- .3 Provide Shop Drawings including layout for safety railing system. Shop drawing shall contain the entire rail layout, showing member sizes and part identification, fasteners, anchors, fittings and evidence of compliance with structural performance requirements.
- .4 Shop Drawings shall clearly show the location of all railings for all roof plans.
- .5 Shop Drawings for permanent type railing applications shall include securement method, size of metal plating, sealing of walls and metal flashing detials. All details shall include dimensions for each railing location.



## 1.6 Quality Assurance

- .1 Manufacturer Qualifications: Minimum of 10 years' experience manufacturing portable railing systems.
- .2 Installer Qualifications: 1 2-person crew capable of positioning base plates and installing portable railing systems in accordance with manufacturer instructions. Provide proof of a minimum of three years experience in the installation of safety railing system.

## 1.7 Delivery, Storage and Handling

- .1 Store products in manufacture's unopened packaging until ready for installation.
- 2 Products
- 2.1 Material

## 2.2 Acceptable Portable Railing Manufacturers

- .1 Garlock Safety System, 2601 Niagara Lane, Plymouth, Minnesota, Tel (763) 694-2614 <u>sales@garlockequp.com</u>, <u>www.railguard.net</u> - railguard 200.
- .2 Bluewater Manufacturing, thru W.S. Safety Technologies, Orillia, Ontario (705) 327-5787 Railguard 2000
- .3 Kee Industrial Products, Keeguard System, 219 Connie St., Concord, (905) 669-1494 Kee Klamp Free Standing Roof Edge Protection System
- .4 Liftsafe Fall Protection, 409 Harmony Ave., Ayr, Ontario, N0B1E0, (519) 896-2430
- .5 Skyline Group International, 19896 Highway 7, Perth, Ontario K7H 3C9 (877) 417-6336.

## 2.3 Design Requirements All Railings

- .1 Structural Performance: Comply with requirements of applicable local, provincial, and federal codes.
  - .1 Structural performance of top rails and supports:
    - .1 Capable of withstanding a concentrated load of 200 pounds (90.6 kg), applied to the top rail at any point and in any direction.

ABCO	N		Safety Railings	Section 05 52 00 St. Lawrence Community Centre
		.2 ( f	Capable of withstanding a oot (74.3 kg/m) applied to simultaneous load of 100 applied vertically downwa	a uniform load of 50 pounds per linear o the top rail horizontally with a pounds per linear foot (148.6 kg/m) ard.
		.3 [ t	Design need not provide to be applied concurrently	for both concentrated and uniform loads /.
		.4 F	Rail system shall be desig engineer licensed in the	gned and stamped by a professional Province of Ontario.
2.4 Mater	ials Po	ortable F	Railings	
.1	Railing	g Sectior	ns.	
	.1	Rails: 1 tubing.	-5/8 inch (41 mm) O.D. b	y 0.065 inch (2.7 mm) wall HREW
	.2	Length:	5 feet (1524 mm).	
	.3	Height:	42 inches (1067 mm).	
	.4	Mid-rail	: weld to posts at 21 inch	es (533 mm) below top rail.
	.5	Finish:	Epoxy powder coated sa	fety yellow or galvanized paint.
.2	Base I	Plates.		
	.1	Materia	I: cast iron class 20B.	
	.2	Size: 1	foot 9-1/2 inches by 1 foo	ot 9-1/2 inches (546 by 546 mm).
	.3	Carrying transpo	g handles: built in with a rter.	center carrying hook for base
	.4	Toeboa	rd receptacles: two, built	in.
	.5	Capacit support	ty: two railing sections an three or four intersecting	d be able to accommodate adapter to grails on the same base.
	.6	Holes: I base to	Holes for permanent mou rail.	inting and round holes for pins securing
	.7	Bottom (806 sq	of base must have a con .cm) to reduce rocking or	icave recess no less than 125 sq. inches n uneven surfaces.
	.8	Base pl substra	ate must provide no less te contact as concentrate	than 5 inches (127 mm) of leading edge ed load is applied to base.
	.9	Finish:	Epoxy powder coated sa	afety yellow or hot dip galvanized



## 3 Execution

#### 3.1 Examination

- .1 Do not begin installation until substrates have been properly prepared.
- .2 If substrate preparation is the responsibility of another installer, notify the Consultant of unsatisfactory preparation prior to proceeding.

#### 3.2 Preparation

- .1 Clean all surfaces thoroughly prior to installation.
- .2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### 3.3 Installation

- .1 Install railing system shall be in strict accordance with manufacturer instructions.
- .2 Before installation, inspect all parts to ensure no damaged parts are used.
- .3 Railing system must be secured to the base plate with securing pins.
- .4 Install metal railing system for roof hatches in full compliance with manufacturer Instructions
- .5 The Contractor shall ensure that all securement locations for fixed railings are properly sealed and have not compromised the roof membrane or membrane flashings.
- .6 The Contractor shall seal all openings in walls, siding and flashing at the location of any removed railing.
- .7 The Contractor shal lensure that no railings intefere with electrical conduit, cable trays or other equipment. Report any deficiencies to the Project Manager prior to application.
- .8 The Contractor upon completion shall ensure that all debris, shipping crates, etc. are removed from all roof surfaces and that the site has been left in clean state.

## 1 General

## 1.1 Related Work

- .1 Section 02 41 19 Selective Demolition
- .2 Section 07 52 50 Modified Bituminous Roofing
- .3 Section 07 62 00 Metal Flashing & Trim
- .4 Section 07 90 00 Sealant

## 1.2 General

.1 The Contractor shall furnish all labour, materials, equipment, tools and supervision necessary to install one new metal ladder to roof D from the main roof for 21 ft ( height to be verified by Contractor)

## 1.3 Scope of Work

- .1 Supply and install new metal ladder to roof D.
- .2 Secure ladder to existing masonry wall and allow for repairs to the wall if required.

## 1.4 References

- .1 Occupational Health & Safety Act and Regulations for Construction Projects, latest edition.
- .2 Ministry of Labour Fixed Access Ladders Engineering Data Sheets 2-04.

## 1.5 Standards

- .1 ALI A14.3 American Ladder Institute Ladders Fixed Safety Requirements
- .2 AWS D1,1 .D1,1M American Welding Society (AWS) . Structural Welding Code Steel
- .3 ASTM A123/A123M American Society Testing Materials, Standard Specification for Zinc Hot Dip Galvanized Coatings on Iron and Steel Products
- .4 ASTM A153/A153M American Society Testing Materials, Standard Specification for Zing Coating Hardware

A	BCO	N         Ladders         Section 05 53 10           St. Lawrence Community Centre
	.5	ASTM A36 American Society Testing Materials, Standard Specification Carbon Structural Steel
	.6	ASTM A653 American Society Testing Materials, Standard Specification Steel Sheet, Zinc Coated
	.7	US Archives and Records Administration (NARA),29CFR1910.23 Ladders
	.8	Ministry of Labour of Ontario, Engineering Data Sheets, 2-04, 7 pages
1.6	Subm	ittals
	.1	Submit copies of manufacturer product data sheets on each product to be used.
	.2	Submit manufacturer installation instructions and recommendations.
	.3	Provide Shop drawing including layout for all ladders. The Shop Drawing shall contain all information on manufacturer of the ladder including all dimensions, size of components, material of components, method of securement, method of painting. Provide paint codes where applicable.
	.4	The shop drawing shall show the exact location of the new ladder.
	.5	Provide a list of all materials to be galvanized.
1.7	Certif	icates
	.1	Provide fabricator certification for ladder assembly stating that the ladder and associated components habe b een fabricated in accordance with reqirements of 29CFR191.0.23 and full compliance with MOL Engineering Data Sheets 2-04.
1.8	Qualit	ty Assurance
	.1	Manufacturer Qualifications: Minimum of 5 years experience manufacturing metal ladder systems.
	.2	Installer Qualifications: $1 - 2$ person crew capable of positioning base plates and installing portable railing systems and metal ladder in accordance with manufacturer instructions. Provide proof of minimum five years experience in the installation of safety railing system and metal ladders.
1.9	Delive	ery, Storage and Handling
	.1	Store products in manufacture's unopened packaging until ready for installation.

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.2 Protect all metal products from corrosion and deformation and or any other damage. Replace any damaged components with new material.

## 2 Products

## 2.1 Material

- .1 All materials to be structural carbon steel to ASTM A36/A36M
- .2 All structural tubing to be ASTM A500/ASTM500M
- .3 Stall steel pipe to be ASTM A53type E or S grade B.
- .4 All anchor bolts, washers, parts shall be galvanized.
- .5 All hot dip galvanized items shall be zinc coated after fabrication. Galvanizing to ASTM A123/A123M, ASTM A153/A153M.
- .6 Steel Ladder:
  - .1 prefabricated steel complete with sufficient rungs to meet height of roof, stringers to extend 150m below the roof hatch opening, maximum space between rungs 300mm. Before leaving the shop all steel shall be galvanized. After erection all bolts shall receive one coat of lead chromate primer. The ladder and all associated components shall be galvanized. Allow for spacing between wall and ladder in manufacture design. Ladder to have a minimum width of 603mm. Provide shop drawings for submission for approval prior to manufacture. Structural design including attachments are to be stamped by a professional engineer. Minimum design load to be 1.1kN. Consider wind, ice, rigging and impact loads in design. Provide design with safety factor of at least 4:1.All parts of ladder to be free of sharp edges, burrs or other hazardous surfaces. The top of uppermost rung of ladder shall be 150mm below the line of egress. Rungs shall have a non slip surface. Ladders shall be structurally supported off the wall and properly secured with adequate bolts. Attachment and anchor bolts shall have a minimum diameter of 12.7mm. Maximum spacing of bolts shall be 1.3m. Ladder shall be secured at the bottom, centre and top of the ladder. All rung spacing shall be 300 mm o.c.. Ladder rung diameter shall be 25mm (1.0 in) and shall be slip resistant. Ladder rung width shall be 600mm



Ladders

# Section 05 53 10 St. Lawrence Community Centre

(24 in.). The ladder or its components shall not interfere with the field of the roof. Contractor to verify height requirement for the ladder.

Note: Contractors may offer aluminum ladders as an alternate.

## 3 Execution

#### 3.1 Examination

- .1 Do not begin installation until substrates have been properly prepared.
- .2 If substrate preparation is the responsibility of another installer, notify the Consultant of unsatisfactory preparation prior to proceeding.

## 3.2 Preparation

- .1 Clean surfaces thoroughly prior to installation
- .2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

## 3.3 Installation

- .1 Install the ladder system in strict accordance with manufacturer instructions.
- .2 Before installation, inspect all parts to ensure no damaged parts are used.
- .3 Verify all measurements and take all necessary field measurements prior to fabrication.
- .4 Provide all necessary anchorage into walls. Provide all necessary bolts and plates to secure the ladder. It is the responsibility of the Contractor to ensure that the ladder is properly secured.
- .5 Repair all damaged masonry, metal flashing and membrane flashing where compromised by the new ladder installation.
- .6 If fabricating ladder in parts ensure that all components are secured together. All materials shall be compatible with each other.
- .7 Seal all openings in siding and metal flashing with caulking.
- .8 Ladders shall be secured to the structural walls with clip angles attached to the stringer. If securing to masonry or concrete do not use less than 0.5 in. (12.7mm) diameter bolts. Install intermediate clip angle supports 200 mm or 48 in on centre.

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Note that the distance. Between the bottom rung of the ladder and the finished roof shall not be greater than 300 mm (12 in.).

Ladders

## 1 General

## 1.1 Related Sections

- .1 Section 02 41 19 Selective Demolition.
- .2 Section 07 55 00 Inverted Modified Bituminous Roofing.
- .3 Section 07 62 00 Metal Flashing & Trim.
- .4 Section 07 90 00 Sealant.

## 1.2 General

- .1 This section specifies the installation of rough carpentry to facilitate the installation of the new roof assembly.
- .2 All Work of this section is to be carried out in strict accordance with the requirements of all relevant sections of the latest edition of the Ontario Building Code and all relevant standards referenced therein.

## 1.3 Scope of Work

- .1 Replace all rotten wood blocking as found.
- .2 Raise all perimeter details to match the height of the new roof. Allow to install three rows of wood blocking plus a wood shim on all perimeter details as required.

# 2 Products

## 2.1 Materials

- .1 Lumber: Unless specified otherwise, use pressure treated softwood, S4S, moisture content 19% or less in accordance with National Standard Grading Rules.
- .2 Lumber Identification: grade stamp of an agency authorised by Canadian Lumber Standards Association Board.
- .3 Furring, Blocking, Nailing Strips, Grounds, Rough Bucks, Cants, Curbs, Fascia Backing and Sleepers: Spruce, standard board sizes, standard grade sizes.
- .4 Plywood: Douglas Fir to CSA 03525.0 92 sheathing grade, pressure treated, one side, minimum 0.5in. thickness.

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- .5 Nails, Spikes and Staples: to CSA B 111 1974.
- .6 Bolts: 0.5in. diameter unless indicated otherwise complete with nuts and washers.
- .7 Proprietary Fasteners: Toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.
- .8 Galvanizing: To CSA G 164 M 92, use galvanized fasteners for exterior pressure preservative treated lumber.
- .9 Wood Preservative: copper napthenate to AWPA 77.

# 3 Execution

## 3.1 Construction

- .1 Comply with the requirements of the Ontario Building Code.
- .2 Furring and blocking shall be installed to space out and provide support to facings, fascia as required by detail drawings.
- .3 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .4 The bottom wood block nailer shall be secured to the deck at one fastener or bolt every 24 in. The fastener or bolt shall be countersunk.
- .5 Nailing strips, grounds and rough bucks shall be installed to provide solid support for frames and other work.
- .6 Nailing strips shall be installed to meet CRCA standards for modified bituminous roofing application only. Back nailing strips are not required for the modified bitumen membrane application.
- .7 Cants, curbs, fascia backing and nailers shall be installed as required and secured firmly in position using galvanized steel fasteners.
- .8 All mechanical curbs and sleepers shall be a minimum of 8 in. above finished membrane.
- .9 Frame, anchor, fasten and brace members to provide necessary strength and rigidity.
- .10 Countersink bolts where necessary to provide clearance for work.
- .11 Treat wood cants, fascia backing, curbs, nailers, sleepers and plywood deck.
- .12 Treat cut surfaces of material with wood preservative before installation.

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- .13 Apply preservative by dipping or by brush to completely cover all cut surfaces. Maintain wet film on surface for minimum of three minute soak on lumber and one minute soak on plywood.
- .14 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

## 1 General

## 1.1 Related Work

- .1 Section 02 41 19 Selective Demolition.
- .2 Section 05 52 00 Railings.
- .3 Section 05 53 10 Ladders.
- .4 Section 06 10 00 Rough Carpentry.
- .5 Section 07 62 00 Metal Flashing.
- .6 Section 07 90 00 Sealant.

## 1.2 General

- .1 This section specifies the removal of the existing roof assembly and installation of a new roof membrane, separation sheet, insulation, filter fabric sheet, sheet metal flashing and accessories.
- .2 Proceed with the Work when air, substrate and environmental conditions meet minimum requirements established by manufacturer's specifications.
- .3 All work in this section shall be carried out in strict accordance with requirements of all relevant sections of the latest edition of the Ontario Building Code and all relevant standards.

The selection of materials as provided in Products section of this specification shall follow all requirements as established by Underwriters Laboratories of Canada (ULC) for the appropriate fire rated assembly chosen.

## 1.3 Scope of Work

.1 This section includes labour, material, equipment, tools and supervision necessary for replacement of roofs A, B, C, E, F, G at 230 The Esplanade, Toronto, Ontario.

Remove the existing roof down to the deck and discard. Keep for reuse existing insulation and ballast. Prime the deck with asphalt primer. Raise the perimeter with three layers of wood blocking and install a new wood shim. Torch apply a modified base sheet membrane to the deck. Install modified peel and stick flashing. Torch apply a modified cap sheet and cap sheet flashing. Install a layer of 6 mil polyethylene sheet. Allow to replace approximately 20% of the insulation.

# Inverted Modified Bituminous Roofing Section 07 55 00 St. Lawrence Community Centre

Install insulation loose laid over the polyethylene sheet. Install a secondary layer of insulation 2.0 in. polystyrene IV insulation over the complete roof except roof A. On roof A install a secondary layer of 1.0 in. polystyrene IV insulation. Install a filter fabric sheet. Install ballast back in place. Install 24 gauge sheet metal flashing. Install new soil vent flashing. Install new drain inserts with U flow seals. Supply and install all sealant. Allow to replace all concrete pavers on roof A. Allow to replace approximately one hundred and twelve (112) concrete pavers on insulation padding. Install new door seals at door to roof. Supply and install a new metal ladder from the main roof to roof D. Install safety railing at the perimeter of roof A. Install a new safety railing around the roof hatch. Applicable to roof A – 4,148 sq. ft., B – 1,144 sq. ft., C – 110 sq. ft., E- 246 sq. ft.. F – 501 sq. ft., G – 2,714 sq. ft.

- .2 This section includes labour, material, equipment, tools and supervision necessary for replacement of roof D at 230 The Esplanade, Toronto, Ontario.
  - .1 Remove the existing roof down to the deck and discard. Mechanically fasten a layer of 0.5 in. Dens Deck Prime over the deck. Prime the board with asphalt primer. Raise the perimeter with three layers of wood blocking and shim. Torch apply a modified base sheet membrane. Install modified peel and stick flashing. Torch apply a modified cap sheet and cap sheet flashing. Install a layer of 4.0 in. base insulation. Install a secondary layer of 2.0 in. polystyrene IV insulation. Install a filter fabric sheet. Install ballast back in place. Install 24 gauge sheet metal flashing. Install new safety railings for the ladder. Install new hot B vent stack flashing and soil vent flashing. Install all sealant. Install concrete pavers at the ladder. Applicable to roof D 1,261 sq. ft.

# 1.4 Codes, Regulations & Minimum Standards

- .1 Execution of the work must meet or exceed:
  - .1 Fire Commissioner of Canada No.301, Standard for Construction Operations.
  - .2 Rules and regulations of authorities having jurisdiction.
  - .3 Occupational Health & Safety Act and Regulation for Construction Projects Revised Statutes of Ontario,1990. Chapter 321, Revised Regulation to date.
  - .4 Canadian Roofing Contractor Association standards for installation of two ply modified membrane.

# Inverted Modified Bituminous Roofing Section 07 55 00 St. Lawrence Community Centre

- .5 CSA A231.1 1972 Precast Concrete Paving Slabs.
- .6 CGSB 37.5 M 89 Cutback Asphalt Plastic Cement.
- .7 CGSB 37 GP 15 M 76 Primer, Asphalt, Unfilled for Asphalt Roofing.
- .8 CGSB 37 GP 15 M 76 Application of Asphalt Primer for Asphalt Roofing.
- .9 CGSB 37 GP 56 M 80 Membrane, Modified Bituminous, Prefabricated and reinforced.
- .10 ASTM A 526 Steel Sheet, Zinc Coated.
- .11 CGSB 51.20 M 87, type 4, Polystyrene Insulation.

## 1.5 Site and Environmental Conditions

- .1 No work shall proceed during rainy weather or inclement weather or if rain is forecasted. If an unforecasted shower is seen approaching, the Contractor must immediately seal the edges of the work and protect any areas of open deck. Only the installation of insulation, filter fabric sheet and ballast may take place during a rainfall.
- .2 All products specified herein must be applied to a clean, dry and frost free surface to achieve adhesion and service life.
- .3 Any exterior wall shall be protected by means of a tarpaulin in the new area where hoisting of equipment or materials takes place.

## 1.6 Removal

- .1 Remove only that portion of the existing roof assembly and flashing system which will immediately be replaced with new roofing materials.
- .2 Dispose and remove existing membrane, damaged insulation, all concrete pavers and sheet metal flashing.
- .3 Do not overload the roof deck.
- .4 Dispose of all debris into garbage boxes.
- .5 Provide records upon completion of the project for delivery and location of all debris removed from site.

## 1.7 Protection

- .1 Protect surrounding areas from asphalt splatter, cover walls in hoisting areas.
- .2 Protect finished roofing at work area with a minimum 0.5 in. plywood extending 3.2m beyond area.

- .3 Prevent asphalt, precipitation and debris from entering openings and drains during work.
- .4 Provide for tarps on walls where lifting of debris is required.
- .5 The Contractor's staff shall provide separate street shoes to be worn whenever entering the building.

## 1.8 Warranty

- .1 Provide a written warranty signed and issued in the name of City of Toronto, Parks & Recreation that the roof assembly will remain leak proof and free from defects such as splitting, lifting, loosening, blisters, expansion, contraction and any other defect which causes degradation to the roofing system for a period of two years from the date of final acceptance of the roof for workmanship and provide a ten year material and workmanship warranty for the roofing system.
- .2 Repair leaks into the building or roofing assembly within 48 hours of notification.
- .3 Inspect the roof 30 days before expiry of the warranty and correct and defects within fifteen (15) days of inspection.
- .4 All defective workmanship and material becoming evident during the time of this warranty must be repaired to restore the work to good condition to the original intent of the plans and specifications. In addition, the Contractor shall remedy any defects due thereto and pay for any damage to other work resulting from defects or poor workmanship.
- .5 The roofing Contractor shall before receipt of final payment, provide three copies of all warranties and or guarantees received from manufacturers, suppliers and sub trades as required in general conditions. All warranties and guarantees shall be signed by a bona fide representative of the company issuing the warranties or guarantees. All warranties shall be addressed to the Owner.

## 1.9 Field Quality Control

.1 At least 48 hours before commencement of the work provide the Engineer with a date each section of the building will be worked upon in order to provide for proper notice to the Owner's field inspector.

# 1.10 Delivery and Equipment

.1 Material shall be delivered to the job site in clearly marked containers indicating the name of the manufacturer and product.

# Inverted Modified Bituminous Roofing Section 07 55 00 St. Lawrence Community Centre

- .2 Store all materials in a dry place and store felts on end until the time of application. Any wet materials must be removed permanently from the job site at the Contractor's expense.
- .3 Do not store roof materials on the new roofing system.
- .4 Store all materials under cover. All tarps must cover the material completely. No insulation shall be left exposed to the environment while not being used.
- .5 Cover insulation exposed to sunlight for more than two days.
- .6 Keep all new material away from open flame or ignition sources.
- .7 Store all modified membrane rolls on end in an upright position. Do not double back rolls.
- .8 Do not store membrane at temperature in excess of 40 degree Celsius.

# 1.11 Shop Drawings & Submittals

- .1 Submit shop drawings of new metal flashing prior to commencement of work.
- .2 Keep a set of specifications and drawings on site at all times. These documents shall be made available to the Owner or Engineer upon request.

## 1.12 Compatibility

.1 Compatibility between components of the roofing system is essential. Bituminous adhesives, insulation, membranes and surface coatings which are to be incorporated into the system must be compatible with each other.

# 2 Products

## 2.1 Materials

- .1 Modified Bitumen Membranes:
  - .1 Base sheet shall be modified bitumen membrane, torch grade, 180 g/m2 non - woven polyester reinforced, SBS polymer type, manufactured to CGSB 37-GP-56M, type 2, Class C, Grade 1. Minimum thickness shall be 3.0 mm thickness, fusible plastic film both sides. Upper surface suitable to receive a torch applied cap sheet.
  - .2 Cap sheet shall be modified bitumen membrane, torch grade, SBS,
     180 g/m2 non- woven polyester, with a thermofusible plastic film on both sides. The thickness shall be a minimum of 3.0 mm thick.



- .1 Approved Manufacturers: Soprema, Bakor, IKO, Siplast or equal.
- .2 Modified Base Flashing: modified bitumen membrane, SBS, prefabricated sheet:
  - .1 Elastophene Flam Stick by Soprema or equal for combustible surfaces.
- .3 Modified Base Flashing For Non Combustible Surfaces: modified base sheet membrane, BS, 180g/m2, 3.0 mm thick, polyethylene both sides, torch grade.
- .4 Modified Cap flashing shall be modified bitumen membrane, torch grade, 250 g/m2 non woven polyester, with a thermofusible film on the bottom side. The thickness shall be a minimum of 4.0 mm thick. The top side shall have a granule coverage, colour grey or brown.
  - .1 Approved Manufacturers: Soprema, Bakor, IKO, Siplast or equal.
- .5 Dens Deck: 0.5 in. Dens Deck Prime by Georgia Pacific.
- .6 Primary Roof Insulation: 4.0 in. thick polystyrene type 4 to CGSB 51.2 M type IV insulation.
  - .1 Approved manufacturers: Dow Chemical or Celfort.
- .7 Secondary Roof Insulation: 2.0 in. thick polystyrene type4 to CGSB 51.2M type IV.
- .8 Separation Sheet: polyethylene film, 6 mil thick.
- .9 Ballast: <sup>3</sup>/<sub>4</sub> in size, well graded, round stone, opaque, non porous, free from fines, long splinters, moisture and dirt.
- .10 Filter Fabric: Woven polyolefin fabric, 100% polyethylene UV stabilized, water permeable, fabric with acrylic binder.
  - .1 Approved manufacturer: Fabrene, Soprema or equal.
- .11 Adhesive Primer for Peel & Stick Membrane: as supplied by modified membrane manufacturer.
- .12 Sheet metal flashing: galvanized steel, 0.61 mm core, 24 gauge, nominal thickness, Z275 zinc coating designation to ASTM A525-86, prefinished to CGSB 93- GP-3M, class F1S, colour white
- .13 Asphalt Primer: shall be complying to CGSB 37-GP-9M or Bakor 910-01 or equal.
- .14 Non Penetrating Asphalt Primer for Metals: shall be Bakor 910-02 or equal.
- .15 Asphalt plastic cement: to conform to CGSB 37-GP-5M Bakor 810-21 or equal.

# Inverted Modified Bituminous Roofing Section 07 55 00 St. Lawrence Community Centre

- .16 Caulking: shall be multi component, chemical curing to CAN 2 19.24 M80 type
  2, class B, one component, elastomeric or one component silicone base, solvent base to CGSB 19 GP 18M.
- .17 Nails: galvanized steel, spiral thread, nailing disc with 25 mm substrate to CSA B111 1974.
- .18 Joint Primer: compatible with sealant primer.
- .19 Wood: to NLGSA standard grading rules.
- .20 Plywood: Douglas Fir or Spruce to CSA sheathing grade 0.5 in thickness.
- .21 Membrane Cap Nails: 1.0 in. in compliance with CSA B 111- 1974.
- .22 Polyethylene back up rope: extruded closed cell foam Shore A hardness 20, tensile strength to 200 KPA, compatible with primers and sealant, oversized 30 to 50%.
- .23 Nails, bolts, screws: material and finish to match sheet metal, size to suit.
- .24 Roof Drain Inserts: copper to match existing size and supplied complete U flow seal or equal or Thaler model RD 15 drain complete with flat drain body, ballast guard and sediment cup, supplied complete with deck clamps.
  - .1 Approved Manufacturers: Thaler, Zurn, Lexsuco or equal.
- .25 Fasteners for concrete and masonry: as supplied and approved by membrane manufacturer, suitable length to provide a minimum of 25 mm embedment into substrate, for predrilled holes, coated to FM4470 finish.
- .26 Joint Filler: extruded polyethylene, closed cell, Shore A, hardness 20, tensile strength 21 psig.
- .27 Concrete Pavers: to CSA A231.1 1972, plain face, 2.0 in. thick, weight 85 lbs each Ccmplete with pedestals.
  - .1 Approved suppliers:
    - .1 Brooklin Concrete Pavers,
    - .2 Pavestone Plus Inc.
    - .3 Pedestals by Lexsuco.
- .28 Door Seals & Door Sweeps: regular grade door seals and door sweeps sized to fit opening.

## 3 Execution

## 3.1 Torch Application & Equipment Safety

- .1 Provide for every torch applicator one full and operational fire extinguisher, suitable for class A, B, C.
- .2 Prior to torch application of roof system give written notification to the local fire department and obtain all necessary permits.
- .3 Contractor shall wear protective gloves, long sleeve shirts and work boots.
- .4 All employees not involved in torch application shall be at least 10 ft. away from flame.
- .5 Never use torches near any combustible materials.
- .6 Do not direct the torch through open roof penetrations.
- .7 When torch is not in use place it on its support with heat aiming upwards.
- .8 At all times and especially leaving the job site make sure that there is no smouldering or concealed fire. Allow for the foreman or an assigned roofer to be on the roof at least one hour after torch application.
- .9 Do not point torch under rooftop units.
- .10 Use caution when torching near pipes in the even there is suction present.
- .11 Do not torch around flammable vents or plastic projections.
- .12 Do not torch near gas lines or electrical wires.
- .13 Do not point torch into corners of roof edges where dried wood or fibre may ignite.
- .14 Do not point the torch at low flashing where there is an overhang and flames could get up under the counter flashing, such as around prefabricated curbs.
- .15 Do not apply bitumen products directly over exposed conduit or pipes lying on the roof deck.
- .16 Train each worker in the proper use of fire extinguisher.
- .17 Do not try to put out a cylinder fire if it cannot be done without tipping the cylinder. Let it burn and call the fire department.
- .18 Do not place fire extinguisher close to liquid propane equipment.
- .19 Use torch in strict accordance with local fire codes.

# ABCON Inverted Modified Bituminous Roofing Section 07 55 00 St. Lawrence Community Centre

- .20 All liquid propane gas tanks not in use shall be stored on the ground.
- .21 Report all fires to the fire department, even those that are extinguished quickly. There may still be a fire smouldering in areas where a layman may not think to look.
- .22 Provide and use a thermal temperature gun to check all modified torch applied cap sheet for hot spots after application.

# 3.2 **Preparation of Deck**

- .1 Remove all existing metal flashing and discard.
- .2 Remove all ballast, membrane and insulation from the roof down to the membrane. Discard damaged or wet membrane only.
- .3 Remove all debris from the membrane and sweep clean. Remove all surface moisture by torching or allow moisture to air dry out.
- .4 In sections where the Engineer designates the membrane to be wet, remove the section of the membrane down to the deck and discard. Inspect the deck for defects.
- .5 Examine the roof deck and immediately inform the Engineer or inspector of any defects.
- .6 Ensure that the decks are firm, straight, smooth, dry and free of dust and debris.
- .7 Apply asphalt primer to all concrete surfaces to which the membrane is to be directly adhered. Allow the primer sufficient time to cure.
- .8 In areas where the membrane is removed apply a modified bitumen base sheet membrane over the area. If the area is too low install two plies of modified base sheet membrane. Tie the new modified membrane to the existing membrane.

# 3.3 Membrane Application All Roofs

- .1 Plan work so that both the side and end laps in separate layers do not superimpose those of the preceding layer. Use a chalk line to start the initial roll of each layer.
- .2 Start all roofing applications at the lowest point to ensure water runs over the laps of the membrane or start preferably at a roof drain.

# Inverted Modified Bituminous Roofing Section 07 55 00 St. Lawrence Community Centre

- .3 Base sheet membrane shall be bonded to the deck with by torch application. The membrane shall be straight line and fully sealed. All wrinkles, blisters and improperly sealed laps shall be corrected or repaired.
- .4 Install modified base sheet membrane in accordance with manufacturer's instructions.
- .5 Lap base and cap sheet 3.0 in on sides and 6 in on ends. Stagger all ends of membrane.
- .6 Cap sheet and base sheet shall be applied vertically on slopes over 1:12 and nailed on 8 in. centres at the upper point with nails on min. <sup>3</sup>/<sub>4</sub> in. diameter head. Installation of the finishing membrane shall be carried out in conformity with the manufacturer's specifications. Asphalt coating shall be softened but not melted as to avoid superheating, using a single nozzle torch seams shall be carefully heated and asphalt overflow shall not exceed <sup>3</sup>/<sub>4</sub> in.
- .7 At all end or head laps of cap sheets, where T joints occurs, cut corner of membrane to overlapped on a 45 degree angle.
- .8 Start all roofing applications at the lowest point to ensure water runs over the laps of the membrane.
- .9 The selected base sheet shall be asphalt based torch applied.
- .10 The selected cap sheet shall be torch applied.
- .11 Install one ply of base sheet and carry to top of wall detail.
- .12 Install one ply of cap sheet and carry to top of wall or edge detail.
- .13 Install prior to membrane any new stack jacks and drains in accordance with the attached reference drawing.

# 3.4 Flashing Application All Roofs

- .1 Primer shall be applied to all metal and concrete surfaces to receive the flashing membrane using manufacturer approved primer.
- .2 Apply the base course flashing using peel and stick flashing membrane and membrane installed in cold adhesive, lapping the membrane 3.0 in. laterally and extend the membrane 6 in. on to the roof surface.
- .3 Apply the flashing cap sheet in hot asphalt, torch applied, lapping 6 in. laterally and extend 9 in. onto the roof surface.
- .4 Anchor flashing membrane using 1.0 in. diameter head nails semi- solidly attached. Nail on minimum 200mm centres.

- .5 Extend the base sheet of the membrane a minimum 6 in. onto roof surface from the edge of the detail.
- .6 Extend the cap sheet membrane a minimum of 9 in. on to roof surface at the edge of the detail.
- .7 The cap sheet flashing shall be torch welded directly on its base sheet proceeding from bottom to top. Torching shall soften the two membranes to ensure a uniform weld.
- .8 The cap flashing shall extend down the outside face of the exterior edge for at least 6 in.
- .9 Prepare all flashing details in accordance with CRCA standards and manufacturer's recommendations and flashing details as shown on drawing.

# 3.5 Polyethylene Separation Sheet

.1 Lay in place over top of the modified cap sheet membrane a layer of polyethylene film sheet. This film sheet shall separate the insulation from the membrane.

## 3.6 Installation of Insulation Roofs

- .1 Lay insulation over completed membrane in one layer without adhesion to the membrane. Stagger end joints and butt end edges tightly together.
- .2 Cover insulation temporarily with opaque polyethylene film or light coloured tarpaulins if insulation is exposed to sunlight for more than three days.
- .3 Install insulation in accordance with manufacturer's instructions.

## 3.7 Filter Fabric Sheet Installation

- .1 Apply fabric unbonded over installed insulation.
- .2 Overlap edges 150mm minimum.
- .3 Slit fabric over roof penetrations. Cut out around roof drains and other openings.
- .4 Extend fabric up roof perimeter cants and roof protrusions. Tuck fabric in place under metal counter flashing.

# ABCON Inverted Modified Bituminous Roofing Section 07 55 00 St. Lawrence Community Centre

## 3.8 Ballast & Protective Covering Roofs

- Apply stone ballast, dry as soon as possible after placement of the fabric filter sheet and apply at the rate of 17 20 lbs per sq. ft. Install ballast at rate of 23 25 lbs per sq. ft. sq. perimeter for 4 ft wide strip.
- .2 Spread stone ballast to an even thickness over the entire roof area.
- .3 After installation of metal flashings, push 2 in. of stone ballast up base of metal to secure toe of flashing.
- .4 Install concrete pavers on pedestals around curbs as shown.
- .5 Install concrete pavers on pedestals as shown on the drawing around mechanical units.

## 3.9 Existing Roof Drains

- .1 Drains shall have any existing drain inserts removed. Install new drain insert to match original drain. Ensure plumbing leader is correctly installed.
- .2 Install roof drain insert seals to ensure that a seal exists between the original drain and new drain insert.
- .3 Drains shall be properly flashed.

#### 3.10 Stack Jacks, Electrical Jacks

.1 Install all stack jacks, electrical jacks and new roof anchor flashing cones in accordance with manufacturer's instructions.

#### 3.11 Metal Flashing

- .1 Install and secure all base and counter metal flashing.
- .2 Install all metal cap flashing on parapet walls.
- .3 Use metal fasteners compatible with the metal of the flashing.
- .4 Secure sections of metal with lock type joints to allow for expansion and contraction.
- .5 Nail metal counter cap flashing as indicated in drawings.
- .6 Caulk all reglet joints where applicable.
- .7 Metal flashing shall form to profile, free of oil canning.
- .8 Maximum 8 ft. length.
- .9 Square, plumb and in line to 1:400.

# Inverted Modified Bituminous Roofing Section 07 55 00 St. Lawrence Community Centre

- .10 Double back exposed edges of metal.
- .11 Join metal flashing with evenly spaced 1.0 in. wide S strips.
- .12 Lock seam corner joints, do not rivet.
- .13 Nail concealed cleats in seams, minimum of 8 in. centre.
- .14 Conceal all fasteners.
- .15 Form Vee groove profiles at all vertical surfaces requiring reglets.
- .16 Install reglets at existing locations or higher than existing if required.
- .17 Clean and dry joints to receive sealant.
- .18 Mask adjoining surfaces if required to protect finish.
- .19 Insert joint filler into Vee groove as indicated.
- .20 Prime joints when required by sealant manufacturer.

## 3.12 Concrete Pavers

.1 Install concrete pavers back in place. Allow to replace broken pavers.

## 3.13 Sealant

.1 Supply and install sealant or caulking at all details as required.

## 3.14 Clean Up

- .1 Clean off all debris from surrounding areas including paved surfaces, sod areas, roof surfaces.
- .2 Clean off all bituminous spills.
- .3 Leave each day job site in a clean and tidy manner. Leave no tools, equipment, ropes, etc.. open to the wind.
- .4 Tarp all roof materials at end of each project day.
- .5 Remove all asphalt stains from walls.
- .6 Replace sod around building at the end of the project.
- .7 Clean all carpeting and floors as required to remove any gravel or asphalt stains.

## 1 General

## 1.1 Related Work

- .1 Section 02 41 19 Selective Demolition.
- .2 Section 06 10 00 Rough Carpentry.
- .3 Section 07 55 00 Inverted Modified Bituminous Roofing.
- .4 Section 07 90 00 Sealant.

## 1.2 General

- .1 This section specifies the fabrication and installation of metal flashing and trim.
- .2 All work in this section shall be carried out in strict accordance with requirements of all other relevant sections and sections of the Ontario Building Code and all relevant standards therein.

#### 1.3 References

- .1 ASTM A526M-86 Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
- .2 Canadian Roofing Contractors Association (CRCA).

## 1.4 Samples

.1 Submit duplicate 2.0 in. x 2.0 in. samples of each type of sheet metal material, colour and finish to the Owner for review prior to application.

## 1.5 Warranty

- .1 Provide a written and signed warranty in the name of **City of Toronto, Parks & Recreation.**
- .2 The warranty shall cover the repair of the metal flashing and associated work as a result of faulty workmanship for a period of two (2) years from the date of substantial completion of the work.
- .3 Where warranties in excess of the two (2) years detailed above are available from the manufacturer, provide the manufacturer's written and signed warranties in the name of **City of Toronto, Parks & Recreation.**



.4 Upon written notice from the Owner, repair all defects of this section within ten working Days. Replace or repair all defective materials to the satisfaction of the Owner, **City of Toronto, Parks & Recreation.** 

# 2 Products

## 2.1 Sheet Metal Materials

- .1 Galvanized steel sheet, 24 gauge thickness, 0.61 mm thickness, commercial quality to ASTM A526 M 86 with Z- 275 designation zinc coating to match existing metal where required.
- .2 Metal strapping, bolts and associated hardware.

## 2.2 Pre finished Steel Sheet

.1 Finish: 8000 series factory applied coating high molecular polyester coating, with zinc phosphate pretreatment, colour Cambridge White, QC8695 or colour to match existing.

## 2.3 Accessories

- .1 Plastic cement: to CGSB 37-GP-5Ma.
- .2 Sealant: In accordance with section [07900].
- .3 Cleats: Of same material and temper as sheet metal, minimum 50 mm wide. Thickness same as sheet metal being secured.
- .4 Fasteners: of same material as sheet metal to CSA B111, flat head roofing nails of length and thickness suitable for metal flashing application.
- .5 Washers: of same material as sheet metal, 1 mm thick with rubber packing.
- .6 Touch-up paint: as recommended by pre finished material manufacturer.
- .7 Eaves Trough: 26gauge, 6 in. wide prepainted metal steel, style D, E or G Figure 1-2 SMACNA guide complete with support straps and pre finished to colour to match metal flashing and trim.
- .8 Eaves trough down pipe outlet, strainer basket and necessary fastenings. Down pipe to be 26 gauge metal, 4 in. x 4 in. size.

## 2.4 Fabrication

.1 Fabricate metal flashing and other sheet metal work in accordance with applicable attached details and CRCA flashing FL series details.

1		Motal Elashing & Trim Section 07 62 00
■AE	sco	St. Lawrence Community Centre
	2	Form pieces in 8 ft. maximum lengths. Make allowance for expansion at joints.
	3	Hem exposed edges on underside 0.5 in Miter and seal corners with sealant.
	4	Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
	5	Form flashings, copings and fascia to profiles indicated of 24 gauge, 0.61 mm thick galvanized pre finished steel.
	6	Provide minimum hook strip extension of 1.2 in at exterior drip edges.
	7	Metal Cap flashing of 0.61 mm thick 24 gauge sheet metal to be built over masonry work.
	8	All metal flashing shall be secured with starter strips.
	9	Metal flashing shall form to profile free from oil canning.
	10	Metal flashing shall be square, plumb and in line 1:400.
	11	Double back exposed edges of metal.
	12	Join metal flashing with evenly spaced 1.0 in wide S strips.
	13	Lock seam corner joints, do not rivet.
	14	Nail concealed cleats in seams, minimum of 8 in o. c.
	15	Conceal all fasteners.
	16	All sections shall be secured with lock type joints.
3 E	Execu	ition
3.1 I	nstall	lation
	1	Install sheet metal work in accordance with all details as shown on drawings.

- .2 Use concealed fastenings except where approved before installation.
- .3 Counter flash bituminous flashing at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips as detailed.
- .4 Lock end joints and caulk with sealant.

## 1 General

## 1.1 Related Work

- .1 Section 02 41 19 Selective Demolition.
- .2 Section 07 55 00 Inverted Modified Bituminous Roofing.
- .3 Section 07 62 00 Metal Flashing & Trim.

#### 1.2 General

- .1 This section specifies the installation of caulking material throughout the Contract areas.
- .2 Proceed with the Work only when air, substrate and material temperatures are above minimum requirements established by manufacturer and surfaces in contact with sealant is completely dry.
- .3 All work of this section is to be carried out in strict accordance with requirements of the Ontario Building Code and all relevant standards referenced therein.

## **1.3 Qualifications & Certification**

- .1 Work of this section shall only be carried out by workmen qualified in the use of the specified materials.
- .2 Before work commences, obtain from the manufacturer written certification that the materials selected are compatible with usage and suitable for the application.

## 1.4 Warranty

- .1 Provide a written and signed warranty in the name of the City of Toronto, Parks & Recreation
- .2 The warranty shall cover the repair of the work of this section and associated work as a result of faulty workmanship.
- .3 The warranty shall be for two (2) years from date of substantial completion of the Work.
- .4 Where warranties in excess of two (2) years detailed above are available from the manufacturer, provide the manufacturer's written and signed warranties in the name of the City of Toronto, Parks & Recreation.

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.5 Upon written notice from the Owner that the Work of this section or related sections is defective, promptly repair or replace defective sections to the Owner's satisfaction.

# 2 Products

## 2.1 Material

- .1 Joint Sealant: multi component, chemical curing to CAN 2 19.24 M80, type 2, class B or one component , elastomeric or one component silicone base to
- .2 CGSB 13 GP 18 M. Approved material Tremco Dymeric or equal, colour white to match metal flashing.
- .3 Joint Filler: extruded polyethylene, closed cell, Shore A, hardness 20, tensile strength to 140 200 kPa.
- .4 Cleaning Materials for Surfaces to Receive Sealant: as recommended by manufacturer of sealant.
- .5 Primers for Surfaces to Receive Sealant: compatible with sealant manufacturer.

## 3 Execution

## 3.1 Installation

.1 Install all joints as designated by the Consultant.

## 3.2 Metal to Metal Joints

- .1 Clean surfaces of all joints and spaces to be sealed in an approved manner. Ensure that surfaces are sound, free of dust, grease, other contaminants which may adversely affect the adhesion of the sealant. Clean surfaces with an approved sealant cleaner.
- .2 Prime inner face surfaces of the joints in accordance with sealant manufacturer's specifications, to provide full adhesion and to prevent staining of face surfaces at joints.
- .3 Finish joints smooth, free from wrinkles, air pockets and embedded foreign materials.
- .4 Prior to application clean and dry out joints to receive sealant.
- .5 Mask adjoining surfaces if required to protect finish.
- .6 Apply sealant in accordance with manufacturer's instructions.

ABC	ON Sealant	Section 07 90 00 St. Lawrence Community Centre
.7	Form concave, slope away fro	om vertical surfaces.

.8 Remove masking tape and sealant smears from adjacent surfaces.



**APPENDIX A** 

St. Lawrence Community Centre

# **APPENDIX A**

# PRE-RENOVATIONS DESIGNATED SUBSTANCES AND HAZARDOUS MATERIAL ASSESSMENT



## CHERIE NG ARCHITECT

AMS ASSET ID	NAME	ASSET BUDGET CATEGORY	WARD	DISTRICT	OWNERSHIP	PRIMARY ADDRESS
309653	ST. LAWRENCE COMMUNITY RECREATION CENTRE	СР	13	Toronto East York	PFR	230 The Esplanade, Toronto, M5A 4J6

#### **Designated Substances Inspection**

DSR Systems Inc. has performed an inspection of the facility condition with respect to the presence of designated substances and mould. The Designated Substance Survey by CCI Group Inc. was reviewed and compared against the current conditions of the facility. The inspection performed was visual and non-invasive, intended to note differences where site conditions appear to have changed, if any. No further DSS samples were taken. The tables below note the findings of the current review compared against the findings of the previous report. Where changes in conditions were noted, they are marked in red, bolded text.

#### **Designated Substances Reported**

Date	FASBESTOS	NFASBESTOS	ACRYLONITRILE	ARSENIC	ASBESTOS	BENZENE	COKE OVEN EMISSIONS	ETHYLENE OXIDE
April 30, 2014	No	No	No	No	No	Likely	No	No
May 23, 2023	No	No	No	No	No	Likely	No	No

Date	ISOCYANATES	LEAD	MERCURY	SILICA	OTHER SUBSTANCES	PCB'S	VISIBLE MOULD	OZONE DEPLETING SUBSTANCES
April 30, 2014	Likely	Likely	Yes	Likely	Likely	No	No	Yes
May 23, 2023	Likely	Likely	Yes	Likely	Likely	No	No	Yes

#### **Changed Conditions Noted**

No changed conditions from the previous report were observed.



# DESIGNATED SUBSTANCE SURVEY

at

St. Lawrence Community Recreation Centre 230 The Esplanade Toronto, Ontario

Prepared for City of Toronto Parks, Forestry, and Recreation

CCI Project No: 135121

April 30, 2014
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# **EXECUTIVE SUMMARY**

Material	Yes	No	Likely
Acrylonitrile		Х	
Arsenic		Х	
Asbestos		Х	
Benzene			Х
Coke Oven Emissions		Х	
Ethylene Oxide		Х	
Isocyanates			Х
Lead			Х
Mercury	Х		
Silica			Х
Vinyl Chloride			Х
PCBs		Х	
Ozone Depleting Substances	X		
Mould		Х	

## **1.0 INTRODUCTION**

In conjunction with the State-of-Good-Repair Audits, RFP 9117-13-5040, CCI Group Inc. carried out a Hazardous Materials Survey of the St. Lawrence Community Recreation Centre located at 230 The Esplanade, Toronto.

The purpose of the survey was to determine the presence of building materials containing certain materials referred to as Designated Substances throughout the location, prior to any scheduled renovations and/or demolition work. Designated Substances are defined as any biological, chemical, or physical agent or combination thereof prescribed as a Designated Substance to which exposure of a worker is prohibited, regulated, restricted, limited or controlled.

## 2.0 REGULATORY REQUIREMENTS

In Ontario, there are a total of eleven Designated Substances. These substances have been regulated under Ontario Regulation 490/09 — *Designated Substances*, made under the Ontario Health and Safety Act, which applies to controlling designated substances in the work place.

The Occupational Health and Safety Act (OHSA), R.S.O. 1990, c.0.1, s.30 (1) specifies that:

"Before beginning a project, the owner shall determine whether any Designated Substances are present at the project site and shall prepare a list of all Designated Substances that are present at the site".



Designated Substances are defined as any biological, chemical, or physical agent or combination thereof prescribed as a Designated Substance to which exposure of a worker is prohibited, regulated, restricted, limited or controlled.

Section 30 of <u>The Act</u> requires that the list of Designated Substances be provided to prospective contractors and subcontractors who may do work on a site and come into contact at the site with Designated Substances.

Acrylonitrile	Isocyanates
Arsenic	Lead
Asbestos	Mercury
Benzene	Silica
Coke Oven Emissions	Vinyl Chloride
Ethylene Oxide	

The Ministry of Labour has designated the following substances:

Ontario Regulation 278/05 (O. Reg. 278/05), the Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations, made under the <u>Occupational</u> <u>Health and Safety Act (OHSA)</u>, requires owners of a building to identify Asbestos-containing Materials (ACMs) prior to potential disturbance of the materials.

In addition, an owner of a building is required to have an Asbestos Management Plan (AMP) if ACMs (friable or non-friable) are present in the building and are to remain in place. An inventory of ACMs must be kept on site. All ACMs must be routinely inspected to ensure no damage has occurred, and the inventory must be updated once in each 12-month period and as may be required based on expected changing site conditions, abatement and/or renovation activities. Removal of all asbestos containing materials is required prior to building demolition.

In addition to the Designated Substances, the building was also surveyed for the presence of other hazardous materials such as polychlorinated biphenyls (PCBs), radioactive materials, ozone depleting substances (ODSs), and mould.

We understand that this survey has been conducted to comply with the regulatory requirements of Ontario Regulation 278/05.



## 3.0 SURVEY METHODOLOGY

Samples may have been obtained to determine the presence of asbestos in building materials and/or lead in paint. Samples were obtained in typically inconspicuous locations so as not to reduce aesthetic qualities. Samples were not taken of materials which would damage the building envelope, such as window sealants and roof materials. When inaccessible areas were encountered during the survey (i.e. wall cavities) inferences were made based upon findings in adjacent spaces. Equipment such as motors, electrical panels, fire doors etc., were not deenergized or disassembled to examine internal components or materials. These items should be considered to contain hazardous materials until proven otherwise.

The survey included a visual assessment for the presence of asbestos, lead, mercury, other Designated Substances and Hazardous Materials. Photographs are included throughout the report.

## 4.0 SCOPE OF WORK

The Designated Substance survey entailed the following:

- Visual review of the building to identify materials which could contain Designated Substances,
- Recommendations for appropriate action where required.

This report details the hazardous substances found within the building, and was prepared for City of Toronto (the client). The assessment was directed on both the interior and exterior structure and finishes of the building. It does not report on possible contaminants in the soil under and surrounding the building, or contents of vessels, drums, etc. that may be concealed.

The survey was conducted on April 10, 2014. After that time, hazardous substances may have been removed from or added to the location. It is the owner's responsibility to disclose whether any hazardous substances have been added to or removed from the building.

This report should be made available to contractors tendering on any renovation or demolition work. In turn, all contractors requesting tenders from subcontractors shall furnish this report to subcontractors.



## **5.0 FIELD WORK AND FINDINGS**

#### **Property Description**



The Survey Area consisted of a three (3) storey community recreation centre with pool and mechanical penthouse, which was constructed in 1992. The building includes a basement. Floor finishes throughout the building include vinyl tiles, ceramic tiles, carpet, hardwood, rubber, and concrete. Wall finishes include gypsum board, concrete block, concrete, wood, and ceramic tiles. Ceiling finishes include textured stucco, gypsum board, lay-in ceiling tiles, metal, and exposed structure. All domestic hot and cold water lines throughout the Survey Area appeared to be either uninsulated metal or PVC, or wrapped with fibreglass insulation and covered in PVC all service wrap.

The following subsections detail our findings:



#### Asbestos

#### Background Information on Asbestos

Asbestos is a generic name that has been given to a group of naturally occurring fibrous minerals. In the past, asbestos was commonly used as a component in building materials such as insulation, fireproofing and acoustic or decorative panels. Although there are many types of asbestos, the three main forms of commercial importance in Ontario are chrysotile, amosite and crocidolite.

An Asbestos-Containing Material (ACM) is defined by O. Reg. 278/05 as a material that contains 0.5 % or more asbestos by dry weight. ACMs are placed into two general classes, "friable" and "non-friable" ACMs. Friable ACMs are those materials that when dry can be crumbled, pulverized and reduced to powder by hand pressure. Typical friable ACMs include acoustical or decorative texture coats, fireproofing, some ceiling tiles and thermal insulation. Non-friable ACMs are much more durable as they are held together by a binder such as cement, vinyl or asphalt. Typical non-friable ACMs include floor tiles, fire blankets, roofing materials and cementitious products such as wallboards, pipes or siding.

It has been recognized that hazardous situations may exist in buildings where asbestoscontaining materials are found. This is especially true where asbestos fibres may become airborne as a result of material ageing, physical damage, and water damage or air movement.

In contrast, there is little reason for concern if the asbestos is in good condition, has not been damaged and is not in a location where it is likely to be disturbed.

#### Asbestos Survey Methodology

The asbestos survey included the identification of potential friable and non-friable asbestoscontaining materials within the facility.

The likelihood of ACMs being present in inaccessible areas such as behind chases and bulkheads was determined by assessing the presence of asbestos-containing systems in adjacent areas.

Fiberglass insulation was not submitted for analysis as it can be identified visually as nonasbestos material.

Past Designated Substance Surveys (DSS) completed by Kleinfeldt Consultants Limited were referenced during this survey. Additional samples were taken where necessary to comply with O. Reg. 287/05. Past results are included in Appendix A where applicable.



#### Asbestos Survey Findings

No suspected ACMs were found during the survey.

• Mechanical Piping Insulation

Mechanical pipe straight and fitting insulation was observed throughout the Survey Area and was observed to contain fibre glass material. Fibre glass is a non-asbestos containing material and thus was not sampled.



• Drywall Joint Compound

Gypsum board joint compound was sampled and found not to contain asbestos.

• Textured Coating

The textured ceiling coating in the Change Rooms and second floor was sampled and found not to contain asbestos.

• Lay-in Ceiling Tiles

Lay-in ceiling tiles and acoustical ceiling tiles were sampled and found not to contain asbestos.

• Vinyl Floor Tiles

Off-white vinyl tiles, installed throughout the user rooms, was sampled and found not to contain asbestos.



• Exterior Door Caulking

Exterior door caulking was not sampled as it is not expected to contain asbestos.

Roofing Material

To avoid damage and compromising the integrity of roofing material, no bulk samples of the roofing materials from roof sections were collected. The roofing materials are unlikely to contain asbestos.

• Storm Drainage Piping

Transite piping, which can contain asbestos, is frequently used in modern construction. The cementitious piping is often used for storm drainage piping. Visible storm drainage piping is concealed by building finishes.

#### Lead

## Background Information on Lead

Lead was a common additive in exterior and hard wearing paint applications. Lead was used to prolong shelf life of paint and to increase its flexibility and durability to wear and weather. Acute exposure to lead by inhalation or ingestion may cause headaches, fatigue, nausea, abdominal cramps and joint pain. Chronic exposures can cause reduced haemoglobin production and reduced lifespan. It has also been known to impact the body's central and peripheral nervous systems and brain function and has been linked to learning disabilities in children.

Currently in Ontario, there is no regulatory limit that determines what concentration of lead constitutes a "lead containing material". On October 21, 2010, Health Canada, under the *Hazardous Products Act*, stated that the lead content in surface-coating materials, furniture, toys and other articles for children, should not exceed 90mg/kg (0.009%, 90ppm). However, this is intended for the importation or sale of products within Canada. Therefore, this is not to be misconstrued as a limit established to define a lead-containing material or a limit with respect to lead on construction projects.

Exposure to lead-containing materials is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act. Care must be taken to



prevent lead-containing particles from becoming airborne during the disturbance of leadcontaining surfaces (i.e., during renovation or demolition projects). All lead abatement work must follow procedures outlined in the <u>Guideline Lead on Construction Projects</u>, issued in September 2004 (amended in April 2011) by the Occupational Health and Safety branch of the Ministry of Labour.

Lead is known to have been used in solder on copper plumbing fixtures, in lead conduit pipes, in lead-calcium battery plates, ammunition, and in nuclear and X-ray shielding devices. However, these materials were not sampled during this investigation, but were noted where applicable.

#### Lead Findings

Due to the age of the building, it is not expected that lead was used in paint. Lead may be present in the soldered joints of copper piping found within this building.

#### Mercury

Mercury is known to cause poisoning in humans through the inhalation of vapours, ingestion of contaminated materials or skin absorption through direct contact with the liquid.

Precautions must be taken to prevent mercury vapours from becoming airborne during renovations or demolition of the building. Exposure to airborne mercury is regulated under the Revised O. Reg. 490/09 as amended – Regulation respecting Mercury – made under the Occupational Health and Safety Act; and under O. Reg. 558, which amended O. Reg. 347/90 (General - Waste Management), mercury is classified as a Schedule 2(b) Hazardous Waste Chemical. Its hazardous waste number is U151.

Mercury is found in products such as thermostats, temperature and pressure gauges, fluorescent lamps and batteries. Mercury in products can be released to the environment through breakage, or disposal at the end of a product's useful life. Improper disposal of these mercury products poses a health and environmental risk to everyone. In addition, the disposal of mercury-containing products can create wastes that are often classified as hazardous. Wastes that leach mercury in concentrations exceeding Ontario Regulation 347/90 (General - Waste Management) limits are also considered hazardous.

## Thermostat Switches

The mercury in thermostats switch contains approximately 3-4 grams of mercury in a glass ampoule, typically attached to a metal coil. Mercury-containing switches have been used in thermostats for over 40 years.



**CCI Group** did not identify any mercury-containing thermostat switches within the Survey Area.

### Fluorescent Light Tubes

Mercury is an essential component in fluorescent lamps and HID lamps. The mercury is in a vapour form and in the phosphor coating on the lamp tube. Estimates of the mercury content contained in compact, 4 foot, and 8-foot lamps are 10 mg and 23 mg respectively.

Most fluorescent lamps qualify as hazardous waste when removed from service and are therefore prohibited from disposal in the solid waste stream. Fluorescent lamps would be classified as 146T on your facility Generator Registration Report under O. Reg. 347/90 - General Waste Management, as amended by O. Reg. 558/00. Under this regulation, if the leachate results exceed 0.1 milligrams of mercury per litre for a given waste, then the facility must treat the waste as hazardous waste. Most fluorescent and HID lamps will exceed the leachate toxicity limit; therefore these wastes must be registered and treated as hazardous waste or sent for recycling.

**CCI Group** identified numerous HID and fluorescent light fixtures with tubes throughout the Survey Area. Mercury is likely to be present in vapor form in the fluorescent light tubes.

#### Silica

Silica is expected to be present in building materials such as concrete, brick, mortar and ceramic tiles located throughout the structures.

Precautions must be taken to prevent silica-containing particles from becoming airborne during the disturbance of silica-containing surfaces, such as during renovation or demolition projects. Exposure to airborne silica is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act. All work being carried with silica containing materials should be conducted following the Guide Silica on Construction Projects issued September 2004 by the Occupational Health and Safety branch of the Ministry of Labour.

#### Vinyl Chloride

Vinyl chloride (monomer) is likely to be present in stable form within poly vinyl-chloride (PVC) piping and conduits and as a component of interior finishes.



#### Acrylonitrile

Acrylonitrile was not noted and would not be expected to be present in the Survey Area.

#### Arsenic

Arsenic or arsenic compounds were not noted and are not expected to be present in the Survey Area.

#### Benzene

Benzene may be present in stable form in roofing materials, paints and adhesives located throughout the subject facility.

#### **Coke Oven Emissions**

Coke oven emissions were not noted and would not be expected to be present in the Survey Area.

#### **Ethylene Oxides**

Ethylene oxide was not noted, and would not be expected to be present in the Survey Area.

#### Isocyanates

Isocyanates compounds may be present in stable form in paint finishes, varnishes, and polyurethane plastics, synthetic rubbers, foams and adhesives.



### Polychlorinated Biphenyls (PCBs)

Polychlorinated Biphenyls (PCBs) were commonly used as dielectric insulating fluid in electrical equipment such as transformers and capacitors, and in the fluorescent and HID lamp ballasts. The production of PCBs in the North America started in 1929 and was banned at the beginning of 1979. After 1981, no manufacturers produced fluorescent and HID lamps with PCB-containing ballasts.

PCBs are not a designated substance under the Occupational Health and Safety Act.

#### PCB Regulations (SOR/2008-273)

The *PCB Regulations* (the Regulations) set specific deadlines for ending the use of PCBs in concentrations at or above 50 mg/kg; eliminating all PCBs and equipment containing PCBs currently in storage and limiting the period of time PCBs can be stored before being destroyed. The Regulations also establish sound practices for the better management of the remaining PCBs in use (i.e. those with content of less than 50 mg/kg), until their eventual elimination, to prevent contamination of dielectric fluids and dispersion of PCBs in small quantities into other liquids.

• Light Ballasts/Transformers

The building is illuminated using newer T-8 fluorescent and compact fluorescent bulbs. The ballasts are not expected to contain PCBs. The transformers are non-PCB type ballasts.

#### **Ozone Depleting Substances (ODS)**

Within Ontario, the general use of ozone depleting substances (ODS) is controlled through Regulation 463/10 of the <u>Environmental Protection Act</u>. Production of ODS in the form of hydro chlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) ceased in Canada in 1993 as a result of their ozone-depleting characteristics. Importation of CFCs into Canada ceased in 1997 and total ban on their use from 2010. The use of these materials is still permitted in existing equipment, but equipment must be serviced by a licensed contractor such that CFCs are contained and not released to the environment during servicing or operation.

A visual assessment for equipment potentially containing ozone-depleting substances was conducted. **CCI Group** noted that the chiller is charged with R-22 refrigerant (chlorodifluoromethane), currently regulated as ozone depleting substance, however strict controls over their manufacture and supply are in place. Under the management of a licensed contractor, equipment containing R-22 does not represent a significant threat to human health or the environment. The refrigerants R-410A, R-404A, and R507 are non-ozone depleting substances.



No other ODS-content equipment was observed in the subject units at the time of site visit.

### Mould

**CCI Group** did not observe any signs of mould in the Survey Area.



## 6.0 CONCLUSIONS AND RECOMMENDATIONS

On the basis of our investigations, representative sampling and laboratory analysis of suspected asbestos and lead containing materials, as well as mould-affected materials; the following conclusions and recommendations are presented:

## <u>Lead</u>

Provide water testing to confirm the presence of lead from copper solder in the water.

#### **Mercury**

Maintain HID and fluorescent fixtures and dispose of as per Ontario Regulations 844 and 347.

## <u>Silica</u>

Precautions should be taken as required during major renovations and demolition projects on concrete (i.e. coring through concrete slabs, demolition of masonry, etc.) to ensure that workers' exposure levels to airborne silica does not exceed 0.05 mg/m<sup>3</sup>.

This can be achieved by:

- providing the workers with respiratory protection;
- wetting the surface of the materials to prevent dust emissions; and,
- Providing workers with facilities to properly wash prior to exiting the work area.
- Demolition work that is likely to impact silica-containing materials should be carried out in accordance with the requirement detailed in the Ontario Ministry of Labour document entitled "Guideline: Silica on Construction Projects", dated September 2004.



## **Ozone Depleting Substances (ODS)**

A visual assessment for equipment potentially containing ozone-depleting substances was conducted. **CCI Group** observed one (1) chiller which was labelled to contain R-22 refrigerant. Under the management of a licensed contractor, equipment containing R-22 does not represent a significant threat to human health or the environment.

• Prior to the demolition/alteration/renovation of the units, all equipment containing ODS must be decommissioned by a licensed contractor such that ozone depleting substances are contained and not released to the environment during decommissioning

## **Other Designated Substances**

Other Designated Substances (acrylonitrile, arsenic, coke oven emissions, ethylene oxide, isocyanates, benzene or vinyl chloride) are not expected to be present in the building in matrix or in sufficient quantities to cause an exceedence of Ministry of Labour exposure guidelines.



# 7.0 GENERAL CONSIDERATIONS AND LIMITATIONS

The information presented in this report is based on information provided by others, direct visual observation made by personnel with **CCI**, and the results of laboratory testing as identified herein.

It should be noted that there might be hazardous materials in locations not visible during our investigation. Prior to any demolition/dismantling of materials additional testing is recommended as a means of worker and occupant protection.

The findings detailed in this report are based upon the information available at the time of preparation of the report. No investigative method eliminates the possibility of obtaining imprecise or incomplete information. Professional judgement was exercised in gathering and analyzing the information obtained and in the formulation of our conclusions and recommendations.

**CCI** does not certify or warrant the environmental status of the property nor the building on the property.

Please note that the passage of time affects the information provided in the report. Environmental conditions of a site can change. Opinions relating to the site conditions are based upon information that existed at the time that the conclusions were formulated.

The client expressly agrees that it has entered into this agreement with **CCI**, both on its own behalf and as agent on behalf of its employees and principals.

The client expressly agrees that **CCI**'s employees and principals shall have no personal liability to the client in respect of a claim, whether in contract, tort and/or any other cause of action in law. Accordingly, the client expressly agrees that it will bring no proceedings and take no action in any court of law against any of **CCI**'s employees or principals in their personal capacity.



#### Hazardous Materials Survey 230 The Esplanade, Toronto, Ontario Reference # 135121

We trust that we have detailed our findings clearly and that we have satisfactorily addressed the scope of work you require at this time. In the event you wish us to review our findings with you, or require our services further in this regard, please do not hesitate to contact our office.

Sincerely, CCI GROUP INC.

Prepared by:

Reinche Roe

Deirdre Roe, B.A.Tech., Dipl.Arch.Tech., FMP Project Manager Corporate Projects



## **APPENDIX A – LAB ANALYSIS**



EMSL Analytical, Inc. 208 Stone Hinge Lane, Carle Place, NY 11514 Phone: (516) 997-7261 Fax: (516) 997-7528 Email: carleplacelab@emsi.com

Attn:	Adrian Cwietkow Kleinfeldt Consulting 2400 Meadowpine B Suite 102 Mississauga, ON L5	g Ívd. N 6S2		Customer ID; Customer PO: Received: EMSL Order:	KLE180 04/21/08 8:45 AM 060806862
Fax: Project	(905) 542-2729 : Job/Project Name:City of	Phone: Toronto,	(905) 542-1600 Job/Project No:3025	EMSL Proj: Analysis Date: Report Date:	4/25/2008 5/1/2008

#### Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos				
Sample	Location	Appearance	%	Fibrous	% Non-Fibrous	% Type	
136.1 060806862-0089	LT ceiling (pinhole) @ PD @ fire exit	Gray Fibrous Homogeneous	40% 15%	Cellulose Glass	45% Nan-fibrous (other)	None Detected	
136.2 060806862-0090	Textured ceiling @ men's change room showers	White Non-Fibrous Homogeneous			25% Ca Carbonate 75% Non-fibrous (other)	None Detected	
136.3 080805862-0091	Compound ceiling @ hallway near pool	Yellow Non-Fibrous Homogeneous			35% Ca Carbonate 65% Non-fibrous (other)	None Detected	
136.4 060806862-0092	LT ceiling @ hallway near pool windows	White/Tan Fibrous Heterogeneous	75%	Cellulose	25% Non-fibrous (other)	None Detected	
136.5 050806862-0093	VT floor (white) @ room 204/205 kitchen	White Non-Fibrous Homogeneous			100% Non-fibrous (other)	None Detected	
136.6 060806862-0094	Textured ceiling @ room 204/205 kitchen	White Non-Fibrous Homogeneous			35% Ca Carbonate 65% Non-fibrous (other)	None Detected	
136.7 060606662-0095	Textured celling (exterior) @ balcony of room 204/	White Non-Fibrous Homogeneous	30%	Cellulose	25% Ca Carbonate 45% Non-fibrous (other)	None Detected	

Analyst(s)

Shereen Thomas (9)

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Michelle McGowan, Laboratory Manager or other approved signatory

Due to magnification limitations inherent in PLM, asbestos fibers in climensions below the resolution capability of PLM may not be detected. The limit of detection as stated in the mathod is 1%. The above test report relates only to the items tested and may not be reproduced in any form without the express written approval of EMSL Analytical, Inc. EMSU's liability is limited to the cost of analysis. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.

AIHA IHLAP 102344, NVLAP Lab Code 101048-10, GA ELAP 2339, CY PH-0249, NY ELAP 11469, MA AA000200, LELAP 04144

PLM-1



EMSL Analytical, Inc. 208 Stone Hinge Lane, Carle Place, NY 11514 Phone: (516) 997-7251 Fax: (516) 997-7528 Emeil: carleplacelab@emsl.com

Attn:	Adrian Cwietkow Kleinfeldt Consul	ting	Customer ID: Customer PO:	KLEI80		
	2400 Meadowpine	e Blvd.	Received:	04/21/08 8:45 AM		
	Suite 102		EMSL Order:	060806862		
	Mississauga, ON	L5N 6S2				
Fax:	(905) 542-2729	Phone:	(905) 542-1600	EMSI Proi		
Project:	: Job/Project Name:Cit	y of Toronto,	Job/Project No:3025	Analysis Date:	4/25/2008	
				Report Date:	5/1/2008	

#### Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

					Non-Asbestos		
Sample	Location	Appearance	%	Fibrous	% Non-Fibrous	% Type	
136.8 060806862-0096	LT ceiling @ ex- woodwork room	Gray Fibrous Homogeneous	40% 25%	Cellulose Glass	35% Non-fibrous (other)	None Detected	
136.9 060605862-0097	Compound @ main office	W hite Non-Fibrous Homogeneous			70% Ca Carbonate 30% Non-fibrous (other)	None Detected	

Analyst(s)

Shereen Thomas (9)

ichile Mc Asnoa

Michelle McGowan, Laboratory Manager or other approved signatory

Due to magnification limitations inherent in PLM, asbestos libers in dimensions below the resolution capability of PLM may not be detected. The limit of detection as stated in the method is 1%. The above test report relates only to the tions tested and may not be reproduced in any form without the express written approval of EMSL Analytical, Inc. EMSL's flability is limitad to the cost of analysis. EMSL beam no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.

AIHA [HLAP 102344, NVLAP Lab Code 101048-10, CA ELAP 2339, CT PH-0249, NY ELAP 11469, MA AA000200, LELAP 04144

PLM-1

THIS IS THE LAST PAGE OF THE REPORT.

2



Client:	CCI Group Inc 7900 Keele Street Concord	, Suite 200 ON	L4K 2A3		Report Date: Report No.: Project: Project No.:	4/23/2014 331783 Toronto-SGR-St Lawrence CC 135121			
BULK SAMPLE ANALYSIS SUMMARY									
Lab No.: Client No.:	5292253 BS01.1	De	escription / Location:	White/Tan F First Floor C	ibrous Corridor Washrooi	ns			
<u>% Asbestos</u>	Туре		% Non-Asbestos Fibrou	s Material	Type	% Non-Fibrous Material			
None Detected	None Detected		95		Cellulose	5			
Lab No.: Client No.:	5292254 BS01.2	De	escription / Location:	White/Tan F Basement Co	ïbrous orridor At Pool				
% Asbestos	Type		% Non-Asbestos Fibrous	s Material	Type	% Non-Fibrous Material			
None Detected	None Detected		95		Cellulose	5			
Lab No.: Client No.:	5292255 BS02.1	De	escription / Location:	White/Tan C Meeting Roo	Ceiling Tile				
% Asbestos	Type		% Non-Asbestos Fibrous	s Material	Туре	% Non-Fibrous Material			
None Detected	None Detected		50 20		Cellulose Mineral Wool	30			
			20						
Lab No.: Client No.:	5292256 BS02.2	De	escription / Location:	White/Tan C Dance Studie	Ceiling Tile o				
% Asbestos	Type		% Non-Asbestos Fibrous	s Material	Type	% Non-Fibrous Material			
None Detected	None Detected		50		Cellulose Mineral Wool	30			
			20						

Accreditations:	NIST-NVLAP No. 101165-0 NY-DOH No. 11021 AIHA-LAP, LLC No. 10018							
	This confidential report relates only to those item(s) t This report shall no.	tested and does not represent an endorsement by NIST-1 of be reproduced except in full, without written approval	NVLAP, AIHA or any agency of the U.S. government of the laboratory.					
Analytical Method: US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)								
Comments: Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitation of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Mantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.								
Analysis Perfor	med By: M. Mirza	Approved By:	Astappe					

**Date:** 4/23/2014

Page 1 of 6

Frank E. Ehrenfeld, III Laboratory Director

Client:	CCI Group Inc		<b>Report Date:</b>	4/23/2014				
	7900 Keele Stree	t, Suite 200	Report No.:	331783				
	Concord	ON L4K 2A3	Project:	Toronto-SGR-St Lawrence CC				
			Project No.:	135121				
BULK SAMPLE ANALYSIS SUMMARY								
Lab No.: Client No.:	5292257 BS02.3	Description / Location:	Tan Ceiling Tile Corridor At Daycare					
% Asbestos	Type	% Non-Asbestos Fibrous	Material Type	% Non-Fibrous Material				
None Detected	None Detected	50 20	Cellulose Mineral Wool	30				
Lab No.: Client No.:	5292258 BS03.1	Description / Location:	White Joint Compound Corridor At Gym's Change Roo	oms				
% Asbestos	Type	% Non-Asbestos Fibrous	Material Type	% Non-Fibrous Material				
None Detected	None Detected	None Detected	None Detected	100				
Lab No.: Client No.:	5292259 BS03.2	Description / Location:	White Joint Compound Office					
% Asbestos	Туре	% Non-Asbestos Fibrous	Material Type	% Non-Fibrous Material				
None Detected	None Detected	None Detected	None Detected	100				

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Analytical Method: US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)							
Comments:	s: Quantification at <0.25% by volume is possible with this method. ( quantifiable under the Point Counting regimen. Analysis includes al present or the client has specifically requested that it not be analyze of the optical microscope. Therefore, PLM is not consistently reliable microscopy (TEM) is currently the only method that can pronounce		PC) Indicates Stratified Point Count Method performe distinct separable layers in accordance with EPA 600 d (ex. analyze until positive instructions). Small asbes le in detecting asbestos in non-friable organically bou materials as non-asbestos containing.	d. (PC-Trace) means that asbestos was detected but is not 0 Method. If not reported or otherwise noted, layer is either not tos fibers may be missed by PLM due to resolution limitations nd (NOB) materials. Quantitative transmission electron			

Analysis Performed By: M. Mirza

Client:	CCI Group Inc				<b>Report Date:</b>	4/23/2014		
	7900 Keele Street	, Suite 200			Report No.:	331783		
	Concord	ON	L4K 2A3		Project:	Toronto-SGR-St Lawrence CC		
					Project No.:	135121		
BULK SAMPLE ANALYSIS SUMMARY								
Lab No.: Client No.:	5292260 BS04.1	D	escription / Location:	White Ceilir Women's Cł	ng Texture nange Room At G	ym		
% Asbestos	Type		% Non-Asbestos Fibrou	s Material	Type	% Non-Fibrous Material		
None Detected	None Detected		None Detected	l	None Detected	100		
Lab No.: Client No.:	5292260 BS04.1	D	escription / Location:	Grey Cemen Women's Ch	ititious nange Room At G	Layer No.: 2		
% Asbestos	Type		% Non-Asbestos Fibrous	s Material	Type	% Non-Fibrous Material		
None Detected	None Detected		Trace		Fibrous Glass	100		
Lab No.:	5292261	D	escription / Location:	White Ceilir	ng Texture			
Client No.:	BS04.2			Second Floo	or Corridor			
<u>% Asbestos</u>	Туре		% Non-Asbestos Fibrous	s Material	Type	<u>% Non-Fibrous Material</u>		
None Detected	None Detected		None Detected	l	None Detected	100		
Lab No.:	5292261	D	escription / Location:	Grey Cemen	titious	Layer No.: 2		
Client No.:	BS04.2			Second Floo	or Corridor			
<u>% Asbestos</u>	Type		% Non-Asbestos Fibrous	s Material	Type	<u>% Non-Fibrous Material</u>		
None Detected	None Detected		None Detected	l	None Detected	100		
	<sup>`</sup>							

Accreditations:	NIST-NVLAP No. 101165-0	NY-DOH No. 11021	AIHA-LAP, LLC No. 100188			
	-NVLAP, AIHA or any agency of the U.S. government al of the laboratory.					
Analytical Metho	Analytical Method: US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)					
Comments: Qua quar pres of th micr	ntification at $<0.25\%$ by volume is possible with this method. (P ntifiable under the Point Counting regimen. Analysis includes all ent or the client has specifically requested that it not be analyzed to optical microscope. Therefore, PLM is not consistently reliabl roscopy (TEM) is currently the only method that can pronounce r	C) Indicates Stratified Point Count Method performed distinct separable layers in accordance with EPA 600 (ex. analyze until positive instructions). Small asbesto e in detecting asbestos in non-friable organically bound naterials as non-asbestos containing.	. (PC-Trace) means that asbestos was detected but is not Method. If not reported or otherwise noted, layer is either not is fibers may be missed by PLM due to resolution limitations d (NOB) materials. Quantitative transmission electron			
Analysis Perfo	ormed By: M. Mirza					

Chent:	CCI Group Inc 7900 Keele Stree	t, Suite 200			Report Date: Report No.:	4/23/2014 331783
	Concord	ON	L4K 2A3		Project: Project No.:	Toronto-SGR-St Lawrence CC 135121
		BULK	SAMPLE ANA	LYSIS	SUMMAR	Y
Lab No.: Client No.:	5292262 BS05.1	I	Description / Location:	Off-White I Meeting Ro	Floor Tile oom	
<u>% Asbestos</u> None Detected	<u>Type</u> d None Detected		<u>% Non-Asbestos Fibrou</u> None Detected	s Material	<u>Type</u> None Detected	<u>% Non-Fibrous Material</u> 100
Lab No.: Client No.:	5292263 BS05.2	I	Description / Location:	Off-White I Meeting Ro	Floor Tile	
<u>% Asbestos</u>	Type		<u>% Non-Asbestos Fibrou</u>	s Material	Type	% Non-Fibrous Material
None Detected	d None Detected		None Detected	I	None Detected	100
Lab No.: Client No.:	5292263 BS05.2	I	Description / Location:	Tan Mastic Meeting Ro	oom	Layer No.: 2
<u>% Asbestos</u>	Type		% Non-Asbestos Fibrou	s Material	Type	% Non-Fibrous Material
None Detected	d None Detected		None Detected	l	None Detected	100

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This report shall not be reproduced except in full, without written approval of the laboratory.     Analytical Method:   US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)						
Comments: Quantificatio quantifiable t present or the of the optical microscopy (	m at <0.25% by volume is possible with this method. (P under the Point Counting regimen. Analysis includes all e client has specifically requested that it not be analyzed incroscope. Therefore, PLM is not consistently reliabl TEM) is currently the only method that can pronounce n	C) Indicates Stratified Point Count Method performed distinct separable layers in accordance with EPA 600 (ex. analyze until positive instructions). Small asbest e in detecting asbestos in non-friable organically bour naterials as non-asbestos containing.	d. (PC-Trace) means that asbestos was detected but is not Method. If not reported or otherwise noted, layer is either not os fibers may be missed by PLM due to resolution limitations ad (NOB) materials. Quantitative transmission electron			

Client:	CCI Group Inc 7900 Keele Stree	t, Suite 200			Report Date: Report No.:	4/23/2014 331783
	Concord	ON	L4K 2A3		Project:	Toronto-SGR-St Lawrence CC
					Project No.:	135121
		BULK	SAMPLE ANA	LYSIS	SUMMAR	Y
Lab No.: Client No.:	5292264 BS05.3	D	Description / Location:	Off-White F Dance Stud	floor Tile io	
<u>% Asbestos</u>	Type		% Non-Asbestos Fibrou	s Material	Type	% Non-Fibrous Material
None Detecte	d None Detected		None Detected		None Detected	100
Lab No.: Client No.:	5292264 BS05.3	E	Description / Location:	Tan Mastic Dance Stud	io	Layer No.: 2
<u>% Asbestos</u>	Туре		% Non-Asbestos Fibrou:	<u>Material</u>	Type	% Non-Fibrous Material
None Detecte	d None Detected		None Detected		None Detected	100
Lab No.: Client No.:	5292265 BS05.4	E	Description / Location:	Off-White F Dance Stud	floor Tile io	
% Asbestos	Туре		% Non-Asbestos Fibrou	Material	Type	% Non-Fibrous Material
None Detecte	d None Detected		None Detected		None Detected	100
Lab No.: Client No.:	5292265 BS05.4	E	Description / Location:	Tan Mastic Dance Stud	0	Layer No.: 2
<u>% Asbestos</u>	Type		% Non-Asbestos Fibrous	Material	Туре	% Non-Fibrous Material
None Detecte	d None Detected		None Detected		None Detected	100

Accreditations:		NIST-NVLAP No. 101165-0 NY-DOH No. 11021 AIHA-LAP, LLC No. 100188   This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA or any agency of the U.S. government					
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Comments: Quantifi quantifi present of of the op microsed		ation at <0.25% by volume is possible with this method. (Pe ole under the Point Counting regimen. Analysis includes all r the client has specifically requested that it not be analyzed tical microscope. Therefore, PLM is not consistently reliable py (TEM) is currently the only method that can pronounce m	C) Indicates Stratified Point Count Method performed distinct separable layers in accordance with EPA 600 (ex. analyze until positive instructions). Small asbesto e in detecting asbestos in non-friable organically boun naterials as non-asbestos containing.	. (PC-Trace) means that asbestos was detected but is not Method. If not reported or otherwise noted, layer is either no os fibers may be missed by PLM due to resolution limitations d (NOB) materials. Quantitative transmission electron			

Analysis Performed By: M. Mirza

Client:	CCI Group Inc 7900 Keele Stree	t Suite 200	Report Date: Report No.:	4/23/2014 331783
	Concord	ON L4K 2A3	Project: Project No.:	Toronto-SGR-St Lawrence CC 135121
		BULK SAMPLE ANA	LYSIS SUMMAR	Y
Lab No.: Client No.:	5292266 BS05.5	Description / Location:	Off-White Floor Tile Second Floor At Kitchen	
% Asbestos	Type	% Non-Asbestos Fibrous	Material Type	% Non-Fibrous Material
None Detected	None Detected	None Detected	None Detected	100
Lab No.: Client No.: <u>% Asbestos</u> None Detected	5292266 BS05.5 <u>Type</u> None Detected	<b>Description / Location:</b> <u>% Non-Asbestos Fibrous</u> None Detected	Tan Mastic Second Floor At Kitchen <u>Material Type</u> None Detected	Layer No.: 2 <u>% Non-Fibrous Material</u> 100
Lab No.: Client No.: <u>% Asbestos</u> None Detected	5292267 BS05.6 <u>Type</u> None Detected	Description / Location: <u>% Non-Asbestos Fibrous</u> None Detected	Off-White Floor Tile Office <u>Material Type</u> None Detected	<u>% Non-Fibrous Material</u> 100

Accreditations:		NIST-NVLAP No. 101165-0 NY-DOH No. 11021 AIHA-LAP, LLC No. 100188   This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA or any agency of the U.S. government This report shall not be reproduced except in full, without written approval of the laboratory.				
Analytical Method: US EPA 600/R-93/116 by Polarized Light Microscopy, (ELAP 198.1 where applicable)						
Comments:	nments: Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbesto quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or other present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.					

Analysis Performed By: M. Mirza

# **APPENDIX B – LOCATION PLAN**



Pool Level



