

SCCB

NEW DRIP PAN AND
SPRINKLER HANGER REPLACEMENT

TECHNICAL SPECIFICATIONS

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PART 1 - GENERAL

- 1.1 RELATED SECTIONS**
- .1 Section 01 33 00 – Submittal Procedures.
 - .2 Section 01 74 11 – Cleaning.
- 1.2 TIME OF EXECUTION**
- .1 Commence work in accordance with notification of acceptance and complete work within approved schedule 6 weeks from the date of such notification.
 - .2 Furnish all necessary work, plant, materials, tools and equipment and carry out in a careful and workmanlike manner and to the satisfaction of the Departmental Representative.
- 1.3 DEFINITIONS**
- .1 "Contract" means the contract documents referred to as such therein and every other document specified or referred to in any of them as forming part of the Contract, all as amended by agreement of the parties.
 - .2 "Superintendent" means the employee or representative of the Contractor designated by the Contractor.
 - .3 "Work" means, subject only to any express stipulation in the Contract to the contrary, everything that is necessary to be done, furnished or delivered by the Contractor to perform the Contract in accordance with the contract documents.
 - .4 General Contractor:
 - .1 The contractor is the General Contractor/Principle Contractor under this contract.
 - .2 The "General Contractor" in this contract is responsible for the management of this Request or any resulting Contract.
 - .5 "Departmental Representative" means the person designated in the Contract, or by written notice to the Contractor, to act as the Departmental Representative for the purposes of the Contract, and includes a person, designated and authorized in writing by the Departmental Representative to the Contractor;
 - .1 Any changes must be authorized in writing by the departmental Representative. The Contractor is not to perform work in excess of or outside the scope of this Request / resulting Contract based on verbal or written requests or instructions from any government personnel other than the aforementioned Departmental Representative.
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- 1.4 NEGOTIATIONS**
- .1 In the event that the lowest compliant tender exceeds the amount of funding Canada has allocated for the construction phase of the work by 15% or more, Canada at its sole discretion, shall either:
 - .1 Cancel the tender call.
 - .2 Obtain additional funding and subject to the provisions of this contract, award to the lowest compliant tender; or
 - .3 negotiate a reduction in the bid price and/or scope of work of not more than 15% with the bidder submitting the lowest compliant bid
- 1.5 SUBMITTALS**
- .1 Refer to Section 01 33 00 – Submittal Procedures
 - .2 Do not proceed with work awaiting approvals until review is complete.
 - .1 Immediately after award of Contract, submit Workers Compensation Board status if applicable.
 - .2 Submit Certificate of insurance immediately after award of Contract.
 - .3 Prior to construction, submit Copies of all worker's:
 - .1 Certificate of Qualification
- 1.6 ACCEPTABLE MATERIAL**
- .1 Approval of alternate materials must be given in writing by the Departmental Representative prior to tender closing.
- 1.7 MEASUREMENTS**
- .1 Measurements, sizes, exact count and dimension are the responsibility of the Contractor to verify. Verify all drawings, measurements and detentions or omissions before commencing the work.
 - .2 Verify all conditions and dimensions prior to fabrication and construction.
 - .3 Notify the Departmental Representative of any discrepancies or divergences from the drawings before proceeding.
- 1.8 SUMMARY OF WORK**
- .1 It shall be the Contractor's responsibility to ascertain the work & conditions affecting the work before submission of a bid for this requirement.
- 1.9 CHANGES**
- .1 Changes to the work shall only be made on receipt of written instructed approval from the Departmental Representative. Any resulting price adjustment to the work shall be agreed upon by the Departmental Representative prior to any implementation
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of the approved changes.

- .2 If the Departmental Representative agrees that the cost of the work will be affected due to contemplated change, the Contractor shall submit a quotation to the Contracting Authority in accordance with the instructions specified herein.
 - .3 Quotations for Contemplated Change Notices (CCN) must include a detailed breakdown of the work, material, plant and equipment costs incurred by the Contractor. Quotations from subcontractors involved in the change must also be supported by similarity detailed breakdowns of the subcontractor's costs.
 - .4 It is the responsibility of the Contractor to ensure that all subcontractor's quotations included in the Contractor's quotation to the Departmental Representative are fair and reasonable in view of the terms expressed herein.
 - .5 The work hours required for the contemplated change shall be based on the estimated number of hours to perform the work.
 - .6 Time spent by a working foreman may be included in the number of hours, at a rate agreed to in writing by the Contractor and the Departmental Representative.
 - .7 Time attributable to material handling, productivity factors and approved rest periods are to be included in the number of hours required by the contemplated change.
 - .8 When a change deletes work which has not yet been performed, the Departmental Representative is entitled to an adjustment in the contract amount same as the cost the Contractor would have incurred had the work not been deleted.
 - .9 If the contemplated change in the work necessitates a change in the contract completion date, or has as impact on the work, the Contractor shall identify and include the resulting cost in the breakdown of its quotation to the Departmental Representative.
 - .10 The work shall conform to the contract documents unless otherwise stated in the contemplated change notice, change order or site instruction signed by the Departmental Representative.
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- .11 Upon acceptance of the Contractor's Quotation by the Departmental representative, the Departmental Representative shall prepare and issue the formal change order.
- .12 Hourly Labour Rate:
 - .1 The hourly labour rate listed in the Contractor's quotation shall be determined in accordance with the collective agreements that are applicable at the site of the work and shall include:
 - .1 The base rate of pay;
 - .2 Vacation pay;
 - .3 Benefits which includes:
 - .1 Welfare contributions;
 - .2 Pension contributions;
 - .3 Union dues;
 - .4 Other application benefits.
- .13 Normal overhead & Profit not included in project are to be shown separately on the construction management cost breakdown sheet supplied by the Departmental Representative.

1.10 SUBCONTRACTING

- .1 Neither the whole nor any part of the work may be subcontracted by the Contractor without the written consent of the Departmental Representative.
 - .2 The Contractor shall notify the Departmental Representative in writing of the Contractor's intention to subcontract.
 - .3 The Contractor shall notify the Departmental Representative in writing identifying the part of the work, and the subcontractor with whom it is intended to subcontract.
 - .4 If the Departmental Representative objects to a subcontracting pursuant, the contractor shall not enter into the intended subcontracting.
 - .5 Neither a subcontracting nor the Departmental Representative's consent to a subcontracting by the Contractor shall be construed to relieve the Contractor from any obligation under the contract or to impose any liability upon the Government of Canada.
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- .6 Should the Departmental Representative consent to the subcontractor, all submittal requirements in this contract shall apply. Submittals shall be made for review by the Departmental Representative prior to the subcontractor being permitted to enter the construction site.
- 1.11 MINIMUM STANDARDS** .1 Materials shall be new and work shall conform to the minimum applicable standards of the Canadian General Standards Board, the Canadian Standards Association, the National Building Code of Canada 2015 (NBC), the National Fire Code 2015 (NFC) and all applicable federal, provincial and municipal codes, laws and by-laws, and to all standards mentioned herein.
- 1.12 TAXES** .1 Pay all taxes properly levied by law (including Federal, Provincial and Municipal).
- 1.13 PROPERTY OF HER MAJESTY** .1 The Contractor shall be liable to Her Majesty for any loss or damage to any property of Her Majesty arising out of the performance of the work whether or not such loss arises from causes beyond his control.
- 1.14 FEES, PERMITS AND CERTIFICATES** .1 Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance certificates. Provide inspection certificates as evidence that work conforms to requirements of Authority having jurisdiction.
- .2 Building permit is not the contractor's responsibility under this contract.
- .3 The Contractor shall comply with all laws and regulations relating to the work, whether Federal, Provincial or Municipal, as if the work were for a person other than Her Majesty, and shall pay for all fees, permits, and obtain all certificates required in respect of the work.
- 1.15 REGULATORY REQUIREMENTS** .1 References and Codes:
.1 Materials shall be new and work shall conform to the minimum applicable standards of the "References" indicated in the specification sections, the National Building Code of Canada 2015 (NBC) and all applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirement shall apply.
- .2 Building Smoking Environment:
.1 Smoking is not permitted in the Building. Obey smoking
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restrictions on building property.

- .3 Hazardous Material Discovery:
 - .1 Stop work immediately when material resembling spray or trowel-applied asbestos, Polychlorinated Biphenyl (PCB), mould or other designated substance is encountered during demolition work.
 - .1 Take preventative measure and promptly notify Departmental Representative.
 - .2 Do not proceed until written instructions have been received from Departmental Representative.

1.16 FIRE SAFETY REQUIREMENTS

- .1 Comply with the Ontario Building Code (OBC), National Building Code of Canada 2015 and the National Fire Code of Canada 2015 for safety of persons in buildings in the event of a fire and the protection of buildings from the effects of fire, as follows;
 - .1 The Ontario Building Code (OBC) and National Building Code (NBCC): for fire safety and fire protection features that are required to be incorporated in a building during construction.
 - .2 The National Fire Code (NFC):
 - .1 The on-going maintenance and use of the fire safety and fire protection features incorporated in buildings.
 - .2 The conduct of activities that might cause fire hazards in and around buildings.
 - .3 Limitations on hazardous contents in and around buildings.
 - .4 The establishment of fire safety plans.
 - .5 Fire safety at construction and demolition sites.
- .2 Welding and cutting:
 - .1 Before welding, soldering, grinding and/or cutting work, obtain a permit as directed by the Departmental Representative. Store flammable liquids in approved CSA containers.
 - .2 At least one week prior to commencing cutting, welding or soldering procedure, provide to Departmental Representative:
 - .1 Notice of intent, indicating devices affected, time and duration of isolation or bypass.
 - .2 Completed welding permit as defined in NFC.
 - .3 Return welding permit to Departmental Representative immediately upon completion of procedures for which permit was issued.
 - .3 "Fire Watchers" as described in NFC shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 15m may be ignited by conduction or radiation.

- .3 Where work requires interruption or cause activation of fire alarms or fire suppression, extinguishing or protection systems:
 - .1 Provide "Watchman Service" as described in NFC; In general, watchman service is defined as an individual conversant with "Fire Emergency Procedures", performing fire picket duty within an unprotected and unoccupied (no workers) area once per hour.
 - .2 Retain services of manufacturer for fire protection systems on daily basis or as approved by Departmental Representative, to isolate and protect all devices relating to:
 - .1 Modification of fire alarms, fire suppression, extinguishing or protection systems; and/or
 - .2 Cutting, welding, soldering or other construction activities that might activate fire protection systems.
 - .3 Immediately upon completion of work, restore fire protection systems to normal operation and verify that all devices are fully operational.
 - .4 Inform fire alarm system monitoring agency and local Fire Department immediately prior to isolation and immediately upon restoration of normal operation.

1.17 TEMPORARY UTILITIES

- .1 Existing services required for work, excluding power required for space temporary heating, may be used by the Contractor without charge. Ensure capacity is adequate prior to imposing additional loads. Connect and disconnect at own expense and responsibility.
- .2 Notify the Departmental Representative and utility companies of intended interruption of services and obtain requisite permission.
- .3 Give the Departmental Representative three weeks notice related to each necessary interruption of any mechanical or electrical service throughout the course of the work. Keep duration of these interruptions to a minimum. Carry out all interruptions after normal working hours of the occupants, preferably on weekends.

1.18 TEMPORARY BARRIERS AND ENCLOSURES

- .1 Maintain existing services to building and provide for personnel and vehicle access.
- .2 Hoarding:
 - .1 Design, erect and maintain temporary site enclosure and covered pedestrian walkways and provide protection, complete with signs and electrical lighting as required by authority having jurisdiction.
- .3 Design, construct and maintain temporary "access to" and

"egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

- .4 Protection:
 - .1 Protect work against damage until take-over.
 - .2 Protect adjacent work against the spread of dust and dirt beyond the work areas.
 - .3 Protect operatives and other users of site from all hazards.
- .5 Work zones:
 - .1 Work zone locations include: all areas identified on drawing, including inside of mechanical pipe shafts.
 - .2 The contractor shall agree to install proper site separation and identification to maintain "Time and Space" at all times throughout the life of the project. When building operations staff, building staff or private sector maintenance personal require access to operational equipment located in the construction area to operate the building, access shall be granted and proper coordination and communication must exist between all parties involved.

1.19 PROTECTION

- .1 All work is being carried out in occupied areas. Protect existing work surfaces, equipment, floors, walls, partitions from damage during construction.
- .2 Protect finished work against damage until take-over.
- .3 Protect adjacent work against the spread of dust and dirt beyond the work areas.
- .4 Protect personal and other users of site from all hazards.
- .5 Provide 48 hours' notice to Departmental Representative for temporary relocation of loose furniture.

1.20 SITE STORAGE

- .1 Storage space shall be equipped and maintained by the Contractor.
 - .2 Do not unreasonably encumber site with materials or equipment.
 - .3 Move stored products or equipment which interfere with operations of Departmental Representative or other contractors.
 - .4 Obtain and pay for use of additional storage or work areas needed for operations.
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- 1.21 REMOVED MATERIALS**
- .1 Unless otherwise specified, materials for removal become the Contractor's property and shall be taken from site.
 - .2 Comply with the Environmental Protection Act, Ontario Regulation O.Reg. 102 / 94 and O. Reg. 103 / 94 for waste management program on construction and demolition projects.
 - .3 Submit complete records of all removals from site including:
 - .1 Time and date of removal.
 - .2 Description of material and quantity.
 - .3 Proof that materials have been received at an approved Waste Processing Site or certified Waste Disposal Site as required.
- 1.22 USE OF SITE FACILITIES**
- .1 Execute work with least possible interference or disturbance to the normal use of premises. Make arrangements with the Departmental Representative to facilitate work as stated.
 - .2 Where elevators, dumbwaiters, conveyors or escalators exist the Contractor may use these at the Departmental Representative's discretion. Protect from damage, safety hazards and overloading of existing equipment.
 - .3 Sanitary facilities will be assigned for Contractor's personnel. Keep facilities clean.
- 1.23 HANGERS**
- .1 Co-ordinate supply and installation of hangers. Obtain Departmental Representative's approval before drilling into structure.
- 1.24 CUT, PATCH AND MAKE GOOD**
- .1 Cut existing surfaces as required to accommodate new work.
 - .2 Remove all items so shown or specified.
 - .3 Patch and make good surfaces cut, damaged or disturbed, to Departmental Representative's approval. Match existing material, colour, finish and texture.
 - .4 Install firestops and smoke seals in accordance with ULC-S115 1995(R2001), around pipe, ductwork, cables, and other objects penetrating fire separations to provide fire resistance not less than the fire resistance rating of surrounding floor, ceiling, and wall assembly.
 - .5 Before proceeding with core drilling of concrete wall or floor, perform Ground Penetrations Radar (GPR) type scanning in area of penetration to ensure that it will not interfere with concealed conduits or piping. Make use of a cable locator to distinguish electrical conduits from re-bars.
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- .6 Obtain Departmental Representative's approval 48 hours before making any openings. Clean the floors/walls immediately and after core drilling is done.
- .7 Core drilling through floors and walls shall be done with diamond drills only. The use of pneumatic hammers will not be permitted.
- 1.25 EXAMINATION**
- .1 Examine site and conditions likely to affect work and be familiar and conversant with existing conditions.
- .2 Provide the Departmental Representative photographs of surrounding properties, objects and structures liable to be damaged or be the subject of subsequent claims.
- 1.26 SIGNS**
- .1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, etc., in both official languages or by the use of commonly understood graphic symbols to the Departmental Representative's approval.
- .2 No advertising will be permitted on this project.
- 1.27 ACCESS AND EGRESS**
- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.
- 1.28 RECORDS, PRINTS, & AS-BUILT DRAWINGS**
- .1 As work progresses, maintain accurate records to show deviations from contract drawings.
- .2 Supply to the Departmental Representative one set of white As-built Drawing with all deviations neatly inked in.
- .3 Contractor to pay for all reproductions.
- 1.29 GUARANTEES AND WARRANTIES**
- .1 Under the Company Letter Head submit a 12 months guarantee.
- .2 Upon notice from the Departmental Representative, any failures or defects in material or workmanship shall be corrected by the Contractor at no further cost to her Majesty within 12 months of the date of acceptance.
- .3 Conduct an inspection of work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
- .4 Notify the Departmental Representative in writing of satisfactory completion of Contractor's Inspection of work to identify obvious defects or deficiencies.
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- .5 The Departmental Representative and Contractor will perform inspection of work to identify obvious defects and deficiencies. Contractor will correct work accordingly.
 - .6 Submit written certificate that following have been performed:
 - .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 system have been tested, and are fully operational.
 - .4 Operation of system have been demonstrated to the Departmental Representative.
 - .5 Work is completed and ready for final Inspection.
 - .7 Request final inspection of work by the Departmental Representative when items noted above are completed. If work is deemed incomplete by the Departmental Representative complete outstanding items and request re-inspection.
- 1.30 CLEAN-UP**
- .1 Reference Section 01 74 11 – Cleaning.
 - .2 Clean up work area as work progresses. At the end of each work period, and more often as per O. Reg. 213/91, s. 35 (1) or if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.
 - .3 Upon completion remove scaffolding, temporary protection and surplus materials. Make good defects noted at this stage.
 - .4 Clean areas under contract to a condition at least to that previously existing and to Departmental Representative's approval.
- 1.31 SECURITY CLEARANCES**
- .1 All personnel employed on this project will be subject to security check. Obtain requisite clearance, for each individual required to enter the premises.
 - .2 All personnel employed on this project must be approved through a security screening process. Obtain reliability level clearance, for each individual requiring access to site.
- 1.32 PRIOR TO COMMENCEMENT**
- .1 Submit to the Departmental Representative the names and date Commencement of birth of his employees who will be working on project site.
- 1.33 BUILDING SMOKING ENVIRONMENT**
- .1 Smoking is not permitted in the Building. Obey smoking restrictions on building property.
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- 1.34 DUST CONTROL**
- .1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of work and public.
 - .2 Maintain and relocate protection until such work is complete.
 - .3 Protect all furnishings within work area with 0.102 mm thick polyethylene film during construction. Remove film during non-construction hours and leave premises in clean, unencumbered and safe manner for normal daytime function.
- 1.35 APPOINTED SUPERVISOR**
- .1 Appoint a supervisor who is an employee of the contractor to be present on site when work is being done and available at all times for the duration of the project.
- 1.36 CONTRACT DOCUMENTS**
- .1 Drawings and specifications are complementary, items shown or mentioned in one and not in the other are deemed to be included in the contract document.
- 1.37 PRECEDENCE**
- .1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.38 PAYMENT**
- .1 Invoice for the work will be processed for the final payment upon its turnover and acceptance by the Departmental Representative. However, if acceptance is subject to deficiencies, a minimum of ten percent (10%) of the total job cost will be held back subject to completion of the entire work, to the satisfaction of the Departmental Representative.
 - .2 Provide a Statutory Declaration duly signed and sealed if contract value exceeds \$25K.
- 1.39 COST BREAKDOWN**
- .1 Before submitting first progress claim, submit breakdown of Contract Amount in detail as directed by Departmental Representative and aggregating the Contract Amount. After approval by Departmental Representative cost breakdown will be used as the basis of progress payments.
 - .2 As a minimum, the cost breakdown should list the following categories of work, with their respective cost. Materials and labour should also be broken down:
 - .1 General Conditions
 - .2 Mobilization
 - .3 Health and Safety requirements
 - .4 Temporary installations, egress, etc.
 - .5 Selective demolition: loose concrete removal
 - .6 Pipe hanger repair
 - .7 Drip pans: supply and install
 - .8 Waste Management
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- .9 Shop drawings
 - .10 Close-out documents
- 1.40 PARKING**
- .1 Contractor is responsible for their own parking.
- 1.41 SHOP DRAWINGS & SAMPLE SUBMITTAL**
- .1 Reference Section 01 33 00 Submittal Procedures.
 - .2 Submit for the Departmental Representative's review, copies of each shop drawings.
 - .3 The term "shop drawing" means drawings, diagram, illustrations, schedules, performance charts, brochures and other data, which are to be provided by the Contractor to illustrate details of a portion of work.
 - .4 The review is for the sole purpose of ascertaining conformance with the general design concept, and does not mean approval of design details inherent in the shop drawings, responsibility for which shall remain with the Contractor. Such review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings requirements of the contract documents.
 - .5 Accompany submission with transmittal letter containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
 - .6 Do not commence manufacture or order materials before shop drawings and samples are reviewed.
- 1.42 SAMPLES**
- .1 Where colour, pattern or texture is criterion, submit full range of samples.
 - .2 Reviewed and accepted samples will become standard of workmanship and material against which installed will be verified.
- 1.43 FIELD QUALITY CONTROLS**
- .1 Carry out Work using qualified licensed workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.
 - .2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licensed workers.
 - .3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to
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perform specific duties.

- .4 Carry out work using a Contractor who holds a valid license issued by the Province in which the work is being contracted.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS**
- .1 Section 01 00 10 – General Instructions.
 - .2 Section 01 32 16.07 – Construction Progress Schedule – Bar (GANTT) Chart.
- 1.2 ACCESS AND EGRESS**
- .1 Design, construct and maintain temporary "access to" and "egress from" work areas in accordance with relevant municipal, provincial, and other regulations.
- 1.3 USE OF SITE AND FACILITIES**
- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
 - .2 Maintain existing services to building and provide for personnel and vehicle access.
 - .3 Contractor shall limit use of premises for Work, to allow for continued occupancy.
 - .4 Departmental Representative will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.
 - .5 Closures: protect work temporarily until permanent enclosures are completed.
- 1.4 OCCUPANCY**
- .1 Premises will be in continuous use during entire construction period for execution of normal operations.
 - .2 Cooperate with Departmental Representative in scheduling operations to minimize conflict and to facilitate Departmental Representative usage.
- 1.5 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING**
- .1 Execute work with least possible interference or disturbance to building operations and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.
- 1.6 EXISTING SERVICES**
- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
 - .2 Where Work involves breaking into or connecting to existing
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services, give Departmental Representative three weeks of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

- .3 Provide for personnel and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 00 10 – General Instructions.

1.7 SPECIAL REQUIREMENTS

- .1 Painting in public or Departmental Representative occupied areas Monday to Friday from 6:00 p.m. to 07:00 a.m. only and on Saturdays, Sundays, and statutory holidays.
- .2 Two (2) weeks out of any given month work **cannot** proceed during normal hours (7:00am to 6:00pm), neither quiet nor noisy work.
- .3 Carry out noise generating Work Monday to Friday from 6:00 p.m. to 07:00 a.m. hours and on statutory holidays, Sundays, and Saturdays.
- .4 Submit schedule in accordance with Section 01 32 16.07- Construction Progress Schedule - Bar (GANNT) Chart.
- .5 Allow for two (2) unforeseen work stoppages by Departmental Representative, each 48 hours in duration.
- .6 Departmental Representative requires at least one (1) week advance notice prior to commencement for anyone accessing the building or any changes in the approved work plan.
- .7 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .8 Keep within limits of work and avenues of ingress and egress.
- .9 Ingress and egress of Contractor vehicles at site is limited to equipment delivery.
- .10 There is no parking authorized within the garage.

- .11 Deliver materials outside of peak traffic hours. Deliveries: 5 p.m. to 07:00 a.m. and 1:00 p.m. to 3:00 p.m. from Monday to Friday unless otherwise approved by Departmental Representative.

1.8 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

- .2 Security clearances:

- .1 Personnel employed on this project will be subject to security check. Obtain clearance for each individual who will require to enter premises.
- .2 Obtain requisite clearance for each individual required to enter premises.
- .3 Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.
- .4 Contractor's personnel will require satisfactory RCMP initiated security screening in order to complete Work in premises and on site.

- .3 Security escort:

- .1 Personnel employed on this project must be escorted when executing work in non-public areas during normal working hours. Personnel must be escorted in all areas after normal working hours.
- .2 Submit an escort request to Departmental Representative 5 days before service is needed. For requests submitted within time noted above, costs of security escort will be paid for by Departmental Representative. Cost incurred by late request will be Contractor's responsibility.
- .3 Any escort request may be cancelled free of charge if notification of cancellation is given at least 8 hours before scheduled time of escort. Cost incurred by late request will be Contractor's responsibility.

- .4 Calculation of costs will be based on average hourly rate of security officer for minimum of 8 hours per day for late service request and of 4 hours for late cancellations.

1.9 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions. Smoking is not permitted.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Federal Legislation
 1. Canada Labour Code, Part II, Section 124 and 125.
Canada Occupational Health and Safety Regulations
 2. Transportation of Dangerous Goods Act, 1992 (TDGA)
 3. Canada Consumer Product Safety Act
 1. Surface Coating Materials Regulations SOR/2005-109.
 4. Canadian Environmental Protection Act, 1999 (CEPA)
 1. PCB Regulations (SOR/2008-273)
 2. Federal Halocarbon Regulations, 2003 (SOR/2003-289)
2. Provincial Legislation
 1. Ontario Occupational Health and Safety Act, R.S.O. 1990, 2010 edition.
 1. Ontario Regulation 490/09 – Designated Substances (O.Reg. 490/09).
 2. Ontario Regulation 278/05 – Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations, (O.Reg. 278/05).
 3. Ontario Regulation 213/91 for Construction Projects (O.Reg. 213/91)
 2. Ontario Environmental Protection Act, R.R.O. 1990,
 1. Ontario Regulation 347/09, General – Waste Management (O.Reg. 347/09).
 2. Ontario Regulations 362/90 – Waste Management, PCBs (O.Reg. 362/90)
 3. Ontario Regulation 463/10, Ozone Depleting Substances and Other Halocarbons (O.Reg. 463/10).
3. Canadian General Standards Board (CGSB).
4. Canadian Standards Association (CSA International). CAN/CSA-Z94.4-11 - Respiratory Protection
5. Underwriters' Laboratories of Canada (ULC).

1.2 DEFINITIONS

- .1 Asbestos-Containing Materials (ACMs): means material that contains 0.5 per cent or more asbestos by dry weight as per Ontario Regulation 278/05.
- .2 Friable Material: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .3 Lead-Containing Material: Paint or surface coating that contains concentrations of lead above the Federal Canada Consumer Product Safety Act's limit of 90 ppm.
- .4 Time-weighted average exposure limit (TWael): the time-weighted average airborne concentration of a biological or chemical agent to which a worker may be exposed in a work day or work week as prescribed by Ontario Regulation 490/09 Designated Substances, as amended.

1.3 DESIGNATED SUBSTANCES

Confirm with the Departmental Representative that no additional designated substances have been brought to the project area prior to beginning work.

Additional designated substances and hazardous materials may exist outside the accessible survey areas but are beyond the scope of this project.

Should any additional material, suspected to be a designated substance, be encountered within the project area, any disturbance of such material must be stopped, precautionary measures taken, and the Departmental Representative must be notified immediately. Do not proceed until written instructions have been received.

1. ACRYLONITRILE: Not Identified
2. ARSENIC: Not Identified
3. ASBESTOS: Identified

Based on historically data, the following materials contain regulated amounts of asbestos:

- Pipe insulation associated with piping that extends around the perimeter walls of the Supreme Court of Canada Parking Garage has been historically confirmed to contain regulated amounts of asbestos. Both straight run and fitting insulation is considered to be asbestos-containing.

Bulk sampling and laboratory analysis has determined that the following materials do not contain regulated amounts of asbestos:

- Cementitious wall and ceiling parging applied throughout the southwest entry vestibule;
 - Drywall joint compound materials in the parking garage;
 - Cementitious wall plaster associated with southwest walls around the garbage and storage rooms;
 - Cementitious parging applied to columns throughout parking garage; and
 - Brick mortar, associated with brick walls in the central north area.
4. BENZENE: Not Identified
 5. COKE OVEN EMISSIONS: Not identified
 6. ETHYLENE OXIDE: Not Identified
 7. ISOCYANATES: Not Identified
 8. LEAD: Identified

Based on the analytical results, the following paints contain concentrations of lead greater than the Federal Canada Consumer Product Safety Act's limit of 90 ppm:

- White paint with green under layer, southwest entry vestibule contains 1,490 ppm lead;
- Beige wall paint, south-west area outside entry vestibule, contains 1,640 ppm lead;
- Brown wall paint, south-west area outside entry vestibule, contains 1,850 ppm lead
- Beige paint applied to concrete ceiling throughout the parking garage, contains 1,010 ppm lead; and
- Red paint applied to sprinkler piping, contains 2,120 ppm lead;

No other paint samples were collected for lead content analysis, as other paints and surface coatings encountered in the project areas were in good condition and sampling without matrix interference (i.e. removing the paint without the substrate material) would have proved difficult. All other paints and surface coatings shall be assumed to contain detectable concentrations of lead, unless specific bulk sampling and laboratory analysis confirms otherwise.

9. MERCURY: Identified
Mercury is suspected to be present in the following:
 - Fluorescent light fixtures containing fluorescent light tubes were observed throughout the project area. Fluorescent light tubes contain mercury in a vapour form and in the phosphor coating on the lamp tube.

10. SILICA: Identified

Free crystalline silica is expected to be present in the following materials:

- Concrete and cement materials;
- Drywall; and
- Brick and mortar materials.

11. VINYL CHLORIDE MONOMER: Not Identified

12. POLYCHLORINATED BIPHENYLS (PCBs): Not Identified

13. MOULD: Not Identified

14. HALOCARBONS: Not Identified

15. OTHER HAZARDOUS MATERIALS: Not Identified

1.4 RECOMMENDATIONS

1. ASBESTOS

All work must be done in accordance with O.Reg 278/05 (as amended).

1. The disturbance of ACMs on construction and demolition projects in the province of Ontario is governed by O.Reg 278/05, as amended. This regulation classifies all asbestos disturbances as Low Risk (Type 1), Moderate Risk (Type 2), or High Risk (Type 3), each of which has defined precautionary measures. All asbestos materials are subject to specific handling and disposal precautions, and must be removed prior to demolition. The Ontario Ministry of Labour (MoL) must be notified of any project involving removal of more than a minor amount (e.g. typically 1 square metre) of friable asbestos material.
2. Identified friable ACMs require a minimum of Type 2 abatement procedures under Ontario Regulation 278/05, as amended, when disturbing/removing/repairing one (1) square metre or less of the material. Should demolition, disturbance, or repair be required of more than one (1) square metre of friable ACM, Type 3 abatement procedures are required. It should be noted that the removal of an unlimited quantity of piping insulation can be completed using Type 2 glovebag procedures, provided that the application of the glovebag does not result in the release of asbestos fibres and that the glovebag seal can be maintained throughout the removal process.
3. Disposal of asbestos waste must be done in accordance with "General – Waste Management" O. Reg 347/90 (as

amended) under the Ontario Environmental Protection Act and the federal Transportation of Dangerous Goods Act. The waste must be disposed at a licensed waste disposal site. Proper notification must be issued to the Departmental Representative prior to transportation of waste.

2. LEAD

1. Follow recommendations provided in the Ontario Ministry of Labour (MoL) Guideline entitled "Guideline: Lead on Construction Projects". This guideline classifies all lead disturbances as Type 1, Type 2a, Type 2b, Type 3a or Type 3b work, and assigns different levels of respiratory protection and work procedures for each classification.
2. Work procedures and personal protective equipment must be used to ensure that workers are not exposed to airborne lead levels that exceed the TWAEI of 0.05 milligram per cubic metre (mg/m³) prescribed by O.Reg 490/09.
3. The use of mechanically-powered tools or torches on lead-containing materials increases the concentration of airborne lead dust or fumes requiring more stringent respiratory protection and controlled work procedures.
4. Even at low concentrations, there may be a potential for exposure to high concentrations of lead depending on the activities performed that disturb the lead-containing materials. At low lead concentrations, conducting a risk assessment to assess the potential for exposure is required to determine the need to follow precautionary measures.
5. Disposal of construction waste containing lead must be done in accordance with O.Reg 347/90 – General Waste Management, as amended, under the Ontario Environmental Protection Act and the federal Transportation of Dangerous Goods Act. The classification of the waste is dependent upon the result(s) of leachate test(s). The waste can be classified as "hazardous," "non-hazardous" or "registerable solid waste" depending on the results of the leachate test.

3. MERCURY

1. All work involving disturbance of mercury-containing equipment must be done in accordance with O.Reg 490/09.
2. Follow recommendations provided in the MoL Guideline entitled "The Safe Handling of Mercury: A Guide for the Construction Industry". This document provides advice on

how to reduce the risk of mercury exposure, and outlines clean-up methods for spills.

3. When removal of fluorescent light tubes is required, the tubes should be removed intact from the fixtures. Other sources of liquid mercury should be removed intact to prevent worker exposure.
4. Disposal of waste containing mercury must be done in accordance with "General – Waste Management" O.Reg 347/90 (as amended) under the Ontario Environmental Protection Act and the federal Transportation of Dangerous Goods Act.

4. SILICA

1. Comply with O.Reg 490/09 when performing works that may disturb silica-containing materials. The regulation provides requirements for allowable exposure levels.
2. Silica dust can be generated through such processes as blasting, grinding, crushing, and sandblasting silica-containing material. Since silica is present in select materials within the project area, appropriate respiratory protection and ventilation must be donned during the demolition and modifications of these structures.
3. Follow recommendations provided in the MoL Guideline entitled "Guideline: Silica on Construction Projects". This document classifies all silica disturbances as Type 1, Type 2 or Type 3 work, and assigns different levels of respiratory protection and work procedures for each classification. These work procedures shall be followed when performing work involving the disturbance of silica-containing materials.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS**
- .1 Section 01 00 10 – General Instructions.
 - .2 Section 01 14 00 – Work Restrictions.
 - .3 Section 01 32 16.07 – Construction Progress Schedule – Bar (GANTT) Chart.
 - .4 Section 01 33 00 – Submittal Procedures.
- 1.2 PRECONSTRUCTION MEETING**
- .1 Within 5 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities, virtual or onsite to be confirmed.
 - .2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
 - .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
 - .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
 - .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.07- Construction Progress Schedules - Bar (GANTT) Chart.
 - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00- Submittal Procedures.
 - .4 Delivery schedule of specified equipment in accordance with Section 01 14 00 – Work Restrictions
 - .5 Site security in accordance with Section 01 00 10 – General Instructions.
 - .6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .7 Departmental Representative provided products.
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- .8 Record drawings in accordance with Section 01 33 00-Submittal Procedures.
- .9 Monthly progress claims, administrative procedures, photographs, hold backs.
- .10 Appointment of inspection and testing agencies or firms.
- .11 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

- .1 During course of Work and 2 weeks prior to project completion, Departmental Representative to schedule progress meeting bi-weekly.
- .2 Contractor, major Subcontractors involved in Work Departmental Representative are to be in attendance.
- .3 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for effect on construction schedule and on completion date.
 - .12 Other business.

PART 2 - PRODUCTS

- 2.1 NOT USED** .1 Not used.

PART 3 - EXECUTION

- 3.1 NOT USED** .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS**
- .1 Section 01 00 10 – General Instructions.
 - .2 Section 01 14 00 – Work Restrictions.
- 1.2 DEFINITIONS**
- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
 - .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally, Bar Chart should be derived from commercially available computerized project management system.
 - .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
 - .4 Construction Work Week: Monday to Friday, inclusive, will provide five-day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
 - .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or work weeks.
 - .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
 - .7 Milestone: significant event in project, usually completion of major deliverable.
 - .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
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- .9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.
- 1.3 REQUIREMENTS**
- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.
- .4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.
- 1.4 ACTION AND INFORMATIONAL SUBMITTALS**
- .1 Provide submittals in accordance with section 01 33 00- submittal procedures.
- .2 Submit project schedule to departmental representative within 10 working days of receipt of acceptance of master plan.
- 1.5 PROJECT MILESTONES**
- .1 Project milestones form interim targets for Project Schedule.
- .1 Indicate dates for security disconnection and re-connection
- .2 Interim Certificate (Substantial Completion) within 18 weeks.
- 1.6 MASTER PLAN**
- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 5 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.
- 1.7 PROJECT SCHEDULE**
- .1 Develop detailed Project Schedule derived from Master Plan.
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- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Shop Drawings.
 - .3 Permits.
 - .4 Mobilization.
 - .5 Removal and cleaning of existing drip pans.
 - .6 Removal of loose concrete.
 - .7 Reinstatement of existing drip pans.
 - .8 Installation of new drip pans.
 - .9 Pipe hanger repair.
 - .10 Final Review.
 - .11 Demobilization.

 - .3 Allow for two (2) unforeseen work stoppages by Departmental Representative, each 48 hours in duration.

 - .4 Two (2) weeks out of any given month work **cannot** proceed during normal hours (7:00am to 6:00pm), neither quiet nor noisy work.

 - .5 Carry out noise generating Work Monday to Friday from 6:00 p.m. to 07:00 a.m. hours and on statutory holidays, Sundays, and Saturdays.

 - .6 Departmental Representative requires at least one (1) week advance notice prior to commencement for anyone accessing the building or any changes in the approved work plan.
- 1.8 PROJECT SCHEDULE REPORTING**
- .1 Update Project Schedule on bi-weekly basis reflecting activity changes and completions, as well as activities in progress.

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

 - .3 Provide a 3 weeks look ahead schedule every Friday by noon during the construction of the project.
- 1.9 PROJECT MEETINGS**
- .1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those
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with projected start or completion dates later than current approved dates shown on baseline schedule.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS** .1 Section 01 00 10 – General Instructions.
- 1.2 ADMINISTRATIVE**
- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples, and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Departmental Representative. This review represents those 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. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are coordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.
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**1.3 SHOP DRAWINGS AND
PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
 - .2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
 - .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
 - .4 Allow 10 days review of each submission to Departmental Representative's.
 - .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
 - .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
 - .7 Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
 - .8 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
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- .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication Methods and requirements.
 - .2 Layout, showing dimensions, including field dimensions, and clearances.
 - .3 Methods of attachment/anchoring.
 - .9 After Departmental Representative's review, distribute copies.
 - .10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
 - .11 Submit electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
 - .12 Submit electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
 - .13 Submit electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
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- .14 Submit electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
 - .15 Submit electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
 - .17 Submit electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
 - .18 Delete information not applicable to project.
 - .19 Supplement standard information to provide details applicable to project.
 - .20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
 - .21 The review of shop drawings by Public Services Procurement Canada (PSPC) is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that PSPC 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 responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is
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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 sub-trades.

1.4 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's business address.
- .3 Notify Departmental Representative 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 Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to the Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which the Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become minimum standard of workmanship and material against which installed Work will be verified.

1.5 MOCK-UPS

- .1 Provide one mock-up each of:
 - .1 Drip Pan Hanger Connection Installation
 - .2 Sprinkler Hanger Anchor Connection Installation
- .2 Erect mock-ups in accordance with respective technical specification.
- .2 Obtain Departmental Representatives review and approval of mock-ups prior to proceeding with Work.
- .3 Approved mock-ups may remain as part of the finished work, at the discretion of the Departmental Representative.

1.6 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Safety and Insurance Board Experience Report.

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- 1.7 FEES, PERMITS AND CERTIFICATES**
- .1 Provide authorities having jurisdiction with information requested.
 - .2 Pay fees and obtain certificates and permits required.
 - .3 Furnish certificates and permits.

PART 2 - PRODUCTS

- 2.1 NOT USED**
- .1 Not used.

PART 3 - EXECUTION

- 3.1 NOT USED**
- .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS** .1 Section 01 00 10 – General Instructions.
- 1.2 REFERENCE STANDARDS** .1 Canada Labour Code, Canada Occupational Safety and Health Regulations.
.2 Canadian Standards Association (CSA)
.1 CSA S350-M1980, Code of Practice for Safety in Demolition of Structures.
.3 Province of Ontario
.1 Occupational Health and Safety Act and Regulations for Construction Projects 213/91 as amended.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS** .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
.1 Results of site specific safety hazard assessment.
.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
.3 COVID-19 policy.
.3 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
.4 The constructor shall advise the Departmental Representative of any accident, injury, near-miss incident, fire, explosion, or chemical spill occurring at the work site and any visit to the site by a governmental enforcement official. The constructor shall provide a written report within 24 hours of any accident, injury, near-miss incident, fire, explosion or chemical spill.
.5 Submit to the Departmental Representative for review, one complete Hazard Assessment Site Specific Health and Safety Plan (HASSSP), and COVID-19 policy, in an indexed format, and a three-ring binder. Once the Departmental Representative has reviewed and accepts the HASSSP binder the Departmental Representative will return to contractor for site use.
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- .6 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 10 days.
 - .7 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
 - .8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
 - .9 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations
- 1.4 SUBMITTALS PRIOR TO CONSTRUCTION**
- .1 Submit Copies of all contractors and worker:
 - .1 Proof of liability Insurance. Insurance must be Site Specific with Site Representative indicated.
 - .2 MOL Registration of constructors and employers engaged in construction form (Form 1000) completed.
 - .3 Employees Working at Heights Training Certificates.
 - .4 Employees WHMIS Certificates.
 - .5 Employees proof of vaccination status.
- 1.5 DOCUMENT VALIDITY**
- .1 Departmental Representative reserves the right to verify the applicability and validity of all documents submitted. No contract will be awarded without the submission of the above documents.
- 1.6 FILING OF NOTICE**
- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
 - .2 Work zone locations include:
 - .1 Underground parking garage.
 - .3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.
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- 1.7 SAFETY ASSESSMENT** .1 Perform site specific safety hazard assessment related to project.
- 1.8 MEETINGS** .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.
- 1.9 REGULATORY REQUIREMENTS** .1 Do Work in accordance with Section 01 00 10 – General Instructions.
- 1.10 PROJECT/SITE CONDITIONS** .1 Refer to site condition and assessment reports for any noted hazardous or contaminated materials or substance present at project site.
- 1.11 GENERAL REQUIREMENTS** .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
- 1.12 RESPONSIBILITY** .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .4 The constructor shall ensure their site supervisor is present and available at all-time throughout the life of the project and is an employee of the constructor.
- 1.13 COMPLIANCE REQUIREMENTS** .1 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.
- .2 Comply with the Health and Safety requirements of CSA Z462
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- Workplace Electrical Safety.
- .3 Comply with the Health and Safety requirements of CSA Z460 Control of Hazardous Energy.
- 1.14 UNFORESEEN HAZARDS** .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.
- 1.15 POSTING OF DOCUMENTS** .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.
- 1.16 CORRECTION OF NON-COMPLIANCE** .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.
- 1.17 POWDER ACTUATED DEVICES** .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.
- 1.18 WORK STOPPAGE** .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to Site Supervisor to stop or start work when, at Site Supervisors discretion, it is necessary or advisable for reasons of health or safety. The Departmental Representative may also stop Work for health and safety considerations.
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- 1.19 PUBLIC SAFETY** .1 Precaution shall be taken to ensure that no person is exposed to undue risk. Risk area shall be adequately barricaded and warning signs (in both official language) or lights shall be installed on each section of the barricades. Barricades shall be without opening.

PART 2 - PRODUCTS

- 2.1 NOT USED** .1 Not used.

PART 3 - EXECUTION

- 3.1 NOT USED** .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS** .1 Section 05 12 23 – Structural Steel for Buildings
- 1.2 INSPECTION**
- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give two (2) business days' notice requesting inspection if Work is designated for special tests, inspections or approvals by the Contract Documents, Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, Contractor shall uncover such Work, have inspections or tests satisfactorily completed and make good such Work, at no cost to the Departmental Representative.
- .4 Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with the Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, Contractor will be required to correct such Work and pay cost of examination and correction.
- .5 Specific inspection points during the work by the Departmental Representative include, but are not limited to, the following:
- .1 Initial survey and identification of repair areas and general area of work.
 - .2 Completed installation of mock-ups.
 - .3 Completed installation of drip pans and sprinkler hanger anchors.
 - .4 Completed demobilization.
- 1.3 ACCESS TO WORK**
- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.
- 1.4 PROCEDURES**
- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.
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.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to the Departmental Representative. Contractor to pay for costs for retesting and re-inspection.

1.5 REJECTED WORK

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

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

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

1.6 REPORTS

.1 Submit copies of third-party inspection and test reports to Departmental Representative.

.2 Provide copies to Subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested.

1.7 TESTING AND MIX DESIGNS

.1 Furnish test results and mix designs as may be requested. All mix designs to be submitted to the Departmental Representative for approval.

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

1.8 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in the specifications. Include for Work of all Sections required to provide mock-ups.

.2 Prepare mock-ups for Departmental Representative's review

with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

- .3 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .4 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS** .1 Section 01 33 00 – Submittal Procedures.
- 1.2 REFERENCE STANDARDS** .1 Canadian General Standards Board (CGSB)
.1 CAN/CGSB 1.189, Exterior Alkyd Primer for Wood.
.2 CGSB 1.59, Alkyd Exterior Gloss Enamel.
- .2 Canadian Standards Association (CSA International)
.1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
.2 CSA-0121, Douglas Fir Plywood.
.3 CAN/CSA-S269.2, Access Scaffolding for Construction Purposes.
.4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.
- .3 Public Works Government Services Canada (PSPC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.
- 1.3 SUBMITTALS** .1 Provide submittals in accordance with Section 01 33 00.
- 1.4 INSTALLATION AND REMOVAL** .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Indicate use of supplemental or other staging area.
- .3 Provide construction facilities in order to execute work expeditiously.
- .4 Remove from site all such work after use.
- 1.5 SCAFFOLDING** .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain ladders, temporary stairs, scaffolding and platforms.
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| 1.6 HOISTING | .1 | Provide, operate and maintain hoists or equipment required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists. |
| | .2 | Hoists to be operated by qualified operator. |
| 1.7 SITE STORAGE/LOADING | .1 | Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products. |
| | .2 | Do not load or permit to load any part of Work with weight or force that will endanger Work. |
| 1.8 CONSTRUCTION PARKING | .1 | There is no parking permitted on site. |
| | .2 | Provide and maintain adequate access to project site. |
| | .3 | Clean runways and taxi areas where used by Contractor's equipment. |
| 1.9 EQUIPMENT, TOOL AND MATERIALS STORAGE | .1 | Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials. |
| | .2 | Remove all material off the site after work shift. |
| 1.10 SANITARY FACILITIES | .1 | Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition. |
| 1.11 CONSTRUCTION SIGNAGE | .1 | Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321. |
| | .2 | Maintain approved signs and notices in good condition for duration of project, and dispose of offsite on completion of project or earlier if directed by Departmental Representative. |
| 1.12 PROTECTION AND MAINTENANCE OF TRAFFIC | .1 | Provide access and temporary relocated roads as necessary to maintain traffic. |
| | .2 | Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative. |
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- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .7 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .8 Dust control: adequate to ensure safe operation at all times.

1.13 CLEAN-UP

- .1 Protect adjacent vehicles and surfaces from dust and construction debris caused by work.
- .2 Remove construction debris, waste materials, packaging material from work site daily.
- .3 Clean dirt or mud tracked onto paved surfaced and vehicles.
- .4 Store materials resulting from demolition activities that are salvageable.
- .5 Stack stored new or salvaged material not in construction facilities.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not used.
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END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS**
- .1 Section 01 73 00 – Execution.
 - .2 Section 01 45 00 – Quality Control.
- 1.2 REFERENCE STANDARDS**
- .1 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
 - .2 Cost for such testing will be borne by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.
- 1.3 QUALITY**
- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
 - .2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
 - .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
 - .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
 - .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
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- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.
- 1.4 STORAGE, HANDLING AND PROTECTION**
- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 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.
- .6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials provided by the manufacturer identical to those used for the manufactured product. Do not paint over name plates.
- 1.5 TRANSPORTATION**
- .1 Pay costs of transportation of products required in performance of Work.
- 1.6 MANUFACTURER'S INSTRUCTIONS**
- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not
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rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re- installation at no increase in Contract Price or Contract Time.

1.7 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.8 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

1.10 REMEDIAL WORK

.1 Refer to Section 01 73 00- Execution.

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

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- .3 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.
- 1.11 LOCATION OF FIXTURES**
- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Departmental Representative of conflicting installation. Install as directed.
- 1.12 FASTENINGS**
- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.
- 1.13 FASTENINGS - EQUIPMENT**
- .1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
- .2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
- .3 Bolts may not project more than one diameter beyond nuts.
- .4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.
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- 1.14 PROTECTION OF WORK IN PROGRESS**
- .1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural
 - .2 member, unless specifically indicated without written approval of Departmental Representative.

- 1.15 EXISTING UTILITIES**
- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and pedestrian and vehicular traffic and/or building occupants.
 - .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 - PRODUCTS

- 2.1 NOT USED**
- .1 Not used.

PART 3 - EXECUTION

- 3.1 NOT USED**
- .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 EXISTING SERVICES**
- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
 - .2 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.
- 1.2 LOCATION OF EQUIPMENT AND FIXTURES**
- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
 - .2 Locate equipment, fixtures, and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access, and maintenance.
 - .3 Inform Departmental Representative of impending installation and obtain approval for actual location.
 - .4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

PART 2 - PRODUCTS

- 2.1 NOT USED**
- .1 Not used.

PART 3 - EXECUTION

- 3.1 NOT USED**
- .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS**
- .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section 01 74 20 – Construction/Demolition Waste Management and Disposal.
- 1.2 ACTION AND INFORMATIONAL SUBMITTALS**
- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit written request 3 weeks in advance of cutting or alteration which affects:
 - .1 Structural integrity of elements of project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of operational elements.
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of Departmental Representative or separate contractor.
 - .3 Include in request:
 - .1 Identification of project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Departmental Representative or separate contractor.
 - .7 Written permission of affected separate contractor.
 - .8 Date and time work will be executed.
- 1.3 MATERIALS**
- .1 Required for original installation.
 - .2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.
- 1.4 PREPARATION**
- .1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
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- .2 After uncovering, inspect conditions affecting performance of Work.
- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.5 EXECUTION

- .1 Execute cutting, fitting, and patching including excavation and fill, To complete Work.
 - .2 Fit several parts together, to integrate with other Work.
 - .3 Uncover Work to install ill-timed Work.
 - .4 Remove and replace defective and non-conforming Work.
 - .5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
 - .6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
 - .7 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
 - .8 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
 - .9 Restore work with new products in accordance with requirements of Contract Documents.
 - .10 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
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.12 Refinish surfaces to match adjoining surfaces: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

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

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 REFERENCE STANDARDS** .1 Canadian Construction Documents Committee (CCDC)
.1 CCDC 2-2008, Stipulated Price Contract.
- 1.1 PROJECT CLEANLINESS** .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Departmental Representative or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site dump containers for collection of waste materials and debris.
- .5 Dispose of waste materials and debris off site.
- .6 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .7 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .8 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .9 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
- 1.2 FINAL CLEANING** .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for
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- 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 Departmental Representative or other Contractors.
 - .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
 - .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.
 - .9 Clean lighting reflectors, lenses, and other lighting surfaces.
 - .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
 - .11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
 - .12 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
 - .13 Remove dirt and other disfiguration from exterior surfaces.
 - .14 Clean and sweep roofs, gutters, areaways, and sunken wells.
 - .15 Sweep and wash clean paved areas.
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- .16 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .17 Clean roofs, downspouts, and drainage systems.
- .18 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .19 Remove snow and ice from access to building.

PART 2 - PRODUCTS

- 2.1 NOT USED** .1 Not used.

PART 3 - EXECUTION

- 3.1 NOT USED** .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 WASTE MANAGEMENT GOALS**
- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PSPC's waste management goal and Contractor's proposed Waste Reduction Workplan for Construction, Renovation and /or Demolition (CRD) waste to be project generated.
 - .2 PSPC's waste management goal: to divert a minimum 75 percent of total Project Waste from landfill sites. Prior to project completion provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced. The overall waste diversion goal for this project is 75%.
 - .3 Specific material target percentages for reuse and/or recycling:
 - .1 Metals: 75%
 - .2 Mechanical - plumbing piping: 75%
 - .3 Electrical - wiring/conduits/boxes: 75%
 - .4 Electrical - lighting: 75%
 - .4 Target percentage goals are achievable for waste diversion. Contractor to review and confirm Departmental Representative's Waste Audit acceptable values.
 - .5 Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste produced by CRD activities.
 - .6 Protect environment and prevent environmental pollution damage.
- 1.2 RELATED SECTIONS**
- .1 Section 01 33 00 – Submittals Procedures.
 - .2 Section 01 74 11 – Cleaning.
- 1.3 DEFINITIONS**
- .1 Approved/Authorized recycling facility: waste recycler approved by applicable provincial authority or other users of material for recycling approved by the Departmental Representative.
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- .2 Class III: non-hazardous waste - construction renovation and demolition waste.
 - .3 Construction, Renovation and/or Demolition (CRD) Waste: Class III solid, non- hazardous waste materials generated during construction, demolition, and/or renovation activities
 - .4 Cost/Revenue Analysis Workplan (CRAW): based on information from Waste Reduction Workplan, and intended as financial tracking tool for determining economic status of waste management practices (Schedule E).
 - .5 Recyclable: ability of product or material to be recovered at end of its life cycle and re- manufactured into new product for reuse.
 - .6 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
 - .7 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
 - .8 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to vendors.
 - .9 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
 - .10 Separate Condition: refers to waste sorted into individual types.
 - .11 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.
 - .12 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction,
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demolition, deconstruction and/or renovation. Involves quantifying by volume/weight amounts of materials and wastes that will be reused, recycled or landfilled. Refer to Schedule A.

- .13 Waste Diversion Report: detailed report of final results, quantifying cumulative weights and percentages of waste materials reused, recycled and landfilled over course of project. Measures success against Waste Reduction Workplan (WRW) goals and identifies lessons learned.
- .14 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as co-ordinating required submittal and reporting requirements.
- .15 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials generated by project. Specifies diversion goals, implementation and reporting procedures, anticipated results and responsibilities. Waste Reduction Workplan (Schedule B) information acquired from Waste Audit.

1.4 DOCUMENTS

- .1 Post and maintain in visible and accessible area at job site, one copy of following documents:
 - .1 Waste Audit (Schedule A).
 - .2 Waste Reduction Workplan (Schedule B).
 - .3 Waste Source Separation Program.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Prepare and submit following prior to project start-up:
 - .1 1 electronic copy of completed Waste Audit (WA): Schedule A.
 - .2 1 electronic copy of completed Waste Reduction Workplan (WRW): Schedule B.
 - .3 1 electronic copy of Cost/Revenue Analysis Workplan (CRAW): Schedule E.
 - .4 1 electronic copy of Waste Source Separation Program (WSSP).
- .3 Prepare and submit on monthly basis, throughout project or at intervals agreed to by Departmental Representative the following:

- .1 Receipts, scale tickets, waybills, and/or waste disposal receipts that show quantities and types of materials reused, recycled, or disposed of.
- .2 Updated Waste Materials Tracking form (Schedule D).
- .3 Written monthly summary report detailing cumulative amounts of waste materials reused, recycled and landfilled, and brief status of ongoing waste management activities.
- .4 Submit prior to final payment the following:
 - .1 Waste Diversion Report, indicating final quantities by material types salvaged for reuse, recycling or disposal in landfill and recycling centres, re-use depots, landfills and other waste processors that received waste materials (See Schedule C).
 - .2 Provide receipts, scale tickets, waybills, waste disposal receipts that confirm quantities and types of materials reused, recycled or disposed of and destination.

1.6 WASTE AUDIT (WA)

- .1 Departmental Representative will prepare WA prior to project start-up. WA will be provided with bid documentation (see Schedule A).
- .2 WA provides detailed inventory, estimated quantities and types of waste materials that will be generated as well as their potential to be reused and/or recycled and project's waste diversion goals and objectives.
- .3 After award of contract, contractor to review WA and confirm that anticipated quantities of waste generated are accurate and goals achievable.
- .4 If after review, contractor determines that indicated quantities or opportunities in WA are not accurate or achievable, contractor to provide written details of discrepancies and revised quantities for areas of concern. Contractor to meet with Departmental Representative to review and justify revisions.
- .5 Post on-site WA where contractor and sub-contractors are able to review content.

1.7 WASTE REDUCTION WORKPLAN (WRW)

- .1 Prepare and submit WRW (Schedule B) at least 10 days prior to project start-up.

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- .2 WRW identifies strategies to optimize diversion through reduction, reuse, and recycling of materials and comply with applicable regulations, based on information acquired from WA.
 - .3 WRW should include but not limited to:
 - .1 Applicable regulations.
 - .2 Specific goals for waste reduction, identify existing barriers and develop strategies to overcome them.
 - .3 Destination of materials identified.
 - .4 Deconstruction/disassembly techniques and schedules.
 - .5 Methods to collect, separate, and reduce generated wastes.
 - .6 Location of waste bins on-site.
 - .7 Security of on-site stock piles and waste bins.
 - .8 Protection of personnel, sub-contractors.
 - .9 Clear labelling of storage areas.
 - .10 Training plan for contractor and sub-contractors.
 - .11 Methods to track and report results reliably (Schedule D).
 - .12 Details on materials handling and removal procedures.
 - .13 Recycler and reclaimer requirements.
 - .14 Quantities of materials to be salvaged for reuse or recycled and materials sent to landfill.
 - .15 Requirements for monitoring on-site wastes management activities.
 - .4 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.
 - .5 Post WRW or summary where workers at site are able to review content.
 - .6 Monitor and report on waste reduction by documenting total volume (in tonnes) and cost of actual waste removed from project (Schedule D).
- 1.8 COST/REVENUE ANALYSIS WORKPLAN (CRAW)**
- .1 Prepare CRAW (see Schedule E) and include the following:
 - .1 Cost of current waste management practices.
 - .2 Implementation cost of waste diversion program.
 - .3 Savings and benefits resulting from waste diversion program.
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- 1.9 WASTE SOURCE SEPARATION PROGRAM (WSSP)**
- .1 As part of Waste Reduction Workplan, prepare WSSP prior to project start-up.
 - .2 WSSP will detail methodology and planned on-site activities for separation of reusable and recyclable materials from waste intended for landfill.
 - .3 Provide list and drawings of locations that will be made available for sorting, collection, handling and storage of anticipated quantities of reusable and recyclable materials.
 - .4 Provide sufficient on-site facilities and containers for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
 - .5 Locate containers to facilitate deposit of materials without hindering daily operations.
 - .6 Provide training for sub-contractors in handling and separation of materials for reuse and/or recycling.
 - .7 Locate separated materials in areas which minimizes material damage.
 - .8 Clearly and securely label containers to identify types/conditions of materials accepted and assist sub-contractors in separating materials accordingly.
 - .9 Monitor on-site waste management activities by conducting periodic site inspections to verify: state of signage, contamination levels, bin locations and condition, personnel participation, use of waste tracking forms and collection of waybills, receipts and invoices.
 - .10 On-site sale of salvaged materials is not permitted unless authorized in writing by Departmental Representative and provided that site safety regulations and security requirements are adhered to.
- 1.10 USE OF SITE AND FACILITIES**
- .1 Execute Work with minimal interference and disturbance to normal use of premises.
 - .2 Maintain security measures established by facility provide temporary security measures approved by Departmental
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Representative.

- 1.11 WASTE PROCESSING SITES** .1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.
- 1.12 QUALITY ASSURANCE** .1 After award of Contract, a mandatory site examination will be held for this Project for Contractor responsible for construction, renovation demolition/deconstruction waste management.
- .1 Date, time and location will be arranged by Departmental Representative.
- .2 Waste Management Meeting: Waste Management Coordinator is to provide an update on status of waste diversion and management activities at each meeting. Written monthly Waste Diversion Report summary to be provided by Waste Management Coordinator (refer to the Waste Diversion Report form in Schedule C and Waste Materials Tracking form in Schedule D).
- 1.13 STORAGE, HANDLING AND PROTECTION** .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed and salvaged materials from movement or damage.
- .6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.
- .7 Protect surface drainage, mechanical and electrical from damage and blockage.
- .8 Provide on-site facilities and containers for collection and
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storage of reusable and recyclable materials.

- .9 Separate and store materials produced during project in designated areas.
- .10 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off site processing facility for separation.
 - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
 - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.14 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of paint thinner, waste, volatile materials, oil mineral spirits into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .4 Remove materials on-site as Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in the waste audit.

1.15 SCHEDULING

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not used.
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PART 3 - EXECUTION

3.1 APPLICATION

- .1 Do Work in compliance with WRW and WSSP.
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with 01 74 21- Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
 - .2 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.
 - .1 Mark containers or stockpile areas.
 - .2 Provide instruction on disposal practices.
- .2 On-site sale of recyclable material is not permitted.

3.4 WASTE DIVERSION REPORT

- .1 At completion of Project, prepare written Waste Diversion Report indicating quantities of materials reused, recycled or disposed of as well as the following:
 - .1 Identify final diversion results and measure success against goals from Waste Reduction Workplan.
 - .2 Compare final quantities/percentages diverted with initial projections in Waste Audit and Waste Reduction Workplan and explain variances.
 - .1 Supporting documentation.
 - .2 Waybills and tracking forms.
 - .3 Description of issues, resolutions and lessons learned.

3.5 WASTE AUDIT (WA) .1 Schedule A - Waste Audit (WA)

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
Wood and Plastics Material Description						
Off-cuts						
Warped Pallet Forms						
Plastic Packaging						
Cardboard Packaging						
Other						
Steel						

3.6 WASTE REDUCTION WORKPLAN (WRW) .1 Schedule B

(1) Material Category	(2) Person(s) Responsible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual	(5) Recycled Amount (unit) Projected	Actual	(6) Material(s) Destination
Wood and Plastics Material Description							
Chutes							
Warped Pallet Forms							
Plastic Packaging							
Card-board Packaging							
Other							
Steel							

3.7 COST/REVENUE ANALYSIS WORKPLAN (CRAW) .1 Schedule E - Cost/Revenue Analysis Workplan (CRAW)

(1) Material Description	(2) Total Quantity (unit)	(3) Volume (cum)	(4) Weight (cum)	(5) Disposal Cost/Credit	(6) Category Sub-Total \$(+/-)
Wood					
		(7) Cost (-) / Revenue			\$

3.8 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT .1 Schedule G - Government Chief Responsibility for the Environment:

Province	Address	General Inquires	Fax
Ontario	Ministry of Environment and Energy, 135 St. Clair Avenue West Toronto ON M4V 1P5	416-323-4321 800-565-4923	416-323-4682

3.9 SCHEDULES .1 Following Schedules are attached to this Specification:
.1 Waste Diversion Report Form - Schedule C.
.2 Waste Materials Tracking Form - Schedule D

END OF SECTION

PART 1 – GENERAL

- 1.1 RELATED SECTIONS**
- .1 Section 01 31 19- Project Meetings.
 - .2 Section 01 33 00- Submittal Procedures.
 - .3 Section 01 71 00- Examination and Preparation.
- 1.2 ADMINISTRATIVE REQUIREMENTS**
- .1 Pre-warranty Meeting:
 - .1 Convene meeting one week prior to contract completion with Departmental Representative, in accordance with Section 01 31 19- Project Meetings to:
 - .1 Verify Project requirements.
 - .2 Review warranty requirements.
 - .2 Departmental Representative to establish communication procedures for:
 - .1 Notifying construction warranty defects.
 - .2 Determine priorities for type of defects.
 - .3 Determine reasonable response time.
 - .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
 - .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.
- 1.3 ACTION AND INFORMATIONAL SUBMITTALS**
- .1 Provide submittals in accordance with Section 01 33 00-Submittal Procedures.
 - .2 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of operating and maintenance manuals in English and French.
 - .3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
 - .4 Provide evidence, if requested, for type, source and quality of products supplied.
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- 1.4 FORMAT**
- .1 Organize data as instructional manual.
 - .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279mm with spine and face pockets.
 - .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
 - .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
 - .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
 - .6 Provide tabbed 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.
 - .1 Bind in with text; fold larger drawings to size of text pages.
 - .9 Provide 1:1 scaled CAD files in dwg format on CD or USB key.
- 1.5 CONTENTS – EACH VOLUME**
- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
 - .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
 - .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
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- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
 - .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- 1.6 AS -BUILT DOCUMENTS AND SAMPLES**
- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
 - .2 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
 - .3 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
 - .4 Keep record documents and samples available for inspection by Departmental Representative.
- 1.7 RECORDING ACTUAL SITE CONDITIONS**
- .1 Record information on set of black line opaque drawings, provided by Departmental Representative.
 - .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
 - .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
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- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 Referenced Standards to related shop drawings and modifications.

 - .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.

 - .6 Other Documents: maintain inspection certifications, field test records, manufacturer's certifications, required by individual specifications sections.

 - .7 Provide digital photos, if requested, for site records.
- 1.8 FINAL SURVEY**
- .1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.
- 1.9 EQUIPMENT AND SYSTEMS**
- .1 For each item of equipment and each system include description of unit or system, and component parts.
 - .1 Give function, normal operation characteristics and limiting conditions.
 - .2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

 - .2 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.
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- .1 Include regulation, control, stopping, shut-down, and emergency instructions.
- .2 Include summer, winter, and any special operating instructions.
- .3 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- .4 Provide servicing and lubrication schedule, and list of lubricants required.
- .5 Include manufacturer's printed operation and maintenance instructions.
- .6 Include sequence of operation by controls manufacturer.
- .7 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- .8 Provide installed control diagrams by controls manufacturer.
- .9 Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.
- .10 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- .11 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- .12 Additional requirements: as specified in individual specification sections.

1.10 MATERIALS AND FINISHES

- .1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
 - .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
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.3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional requirements: as specified in individual specifications sections

1.11 DELIVERY, STORAGE AND HANDLING

.1 Store in original and undamaged condition with manufacturer's seal and labels intact.

.2 Store components subject to damage from weather in weatherproof enclosures.

.3 Store paints and freezable materials in a heated and ventilated room.

.4 Remove and replace damaged products at own expense and for review by Departmental Representative.

1.12 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative approval.

.3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.

.6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:

.1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
- .4 Verify that documents are in proper form, contain full information, and are notarized.
- .5 Co-execute submittals when required.
- .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct joint 6-month and 12-month warranty inspection, measured from time of acceptance, by Departmental Representative.
- .9 Include information contained in warranty management plan as follows:
 - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
 - .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include fire protection, sprinkler systems, alarm systems.
 - .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
 - .1 Name of item.
 - .2 Model and serial numbers.
 - .3 Location where installed.
 - .4 Name and phone numbers of manufacturers or suppliers.
 - .5 Names, addresses and telephone numbers of sources of spare parts.
 - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
 - .7 Cross-reference to warranty certificates as

- applicable.
- .8 Starting point and duration of warranty period.
- .9 Summary of maintenance procedures required to continue warranty in force.
- .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
- .11 Organization, names and phone numbers of persons to call for warranty service.
- .12 Typical response time and repair time expected for various warranted equipment.
- .4 Contractor's plans for attendance at 6 and 12 month post-construction warranty inspections.
- .5 Procedure and status of tagging of equipment covered by extended warranties.
- .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

- .10 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .11 Written verification to follow oral instructions.
 - .1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.13 WARRANTY TAGS

- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water-resistant tag approved by Departmental Representative.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.
- .3 Leave date of acceptance until project is accepted for occupancy.
- .4 Indicate following information on tag:
 - .1 Type of product/material.
 - .2 Model number.
 - .3 Serial number.
 - .4 Contract number.
 - .5 Warranty period.
 - .6 Inspector's signature.

.7 Construction Contractor.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS**
- .1 Section 01 14 25 – Designated Substances
 - .2 Section 02 82 00.03 – Asbestos Abatement: Maximum Precautions
 - .3 Section 02 83 20 – Lead Precautionary Measures
 - .4 Section 02 89 00 – Silica Precautionary Measures
- 1.2 REFERENCES**
- .1 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-1.205-03, Sealer for Application of Asbestos-Fibre Releasing Materials.
 - .2 Department of Justice Canada (Jus).
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
 - .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
 - .4 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
 - .5 Ontario Environmental Protection Act, R.R.O 1990,
 - .1 General – Waste Management, O. Reg. 347/90, as amended.
 - .6 Underwriters' Laboratories of Canada (ULC).
 - .7 National Joint Council (NJC).
 - .1 Part XI – Hazardous Substances.
 - .8 Ontario Ministry of Labour (MoL).
 - .1 Occupational Health and Safety Act, R.S.O 1990, c. O1 (OSHA)
 - .1 O.Reg. 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, as amended
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- .2 Ontario Occupational Health and Safety Act, R.S.O. 1990, Regulation 490/09 "Designated Substances", as amended.
- .3 O.Reg 213/91 - "Construction Projects", as amended.

1.3 DEFINITIONS

- .1 Amended Water: water with non-ionic surfactant wetting agent added to reduce surface tension of water to allow wetting of fibres.
- .2 Asbestos-Containing Materials (ACMs): materials that contain 0.5 percent or more asbestos by dry weight, identified under Existing Conditions Article, including fallen materials and settled dust.
- .3 Asbestos Work Area: area where work takes place which will, or may disturb ACMs.
- .4 Authorized Visitors: Departmental Representative, and representative(s) of regulatory agencies.
- .5 Competent worker: in relation to specific work, means a worker who:
 - .1 Is qualified because of knowledge, training and experience to perform the work.
 - .2 Is familiar with the provincial laws and with the provisions of the regulations that apply to the work.
 - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .6 Curtained doorway: arrangement of closures to allow ingress or egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:
 - .1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.
 - .2 Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing.
 - .3 Overlap each polyethylene sheet at openings not less than 1.5 metres on each side.

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- .7 DOP Test: testing method used to determine integrity of Negative Pressure unit using Dispersed Oil Particulate (DOP) HEPA-filter leak test.
 - .8 Friable Material: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
 - .9 Glove Bag: prefabricated glove bag as follows:
 - .1 Minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag.
 - .2 Integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elastic ports.
 - .3 Equipped with reversible, double-pull, double throw zipper on top and at approximately mid-section of the bag.
 - .4 Straps for sealing ends around pipe.
 - .5 Must incorporate internal closure strip if it is to be moved or used in more than one specific location.
 - .10 Hazardous Material Workplan: A brief report identifying the location and quantities of hazardous materials and the methods that will be used to remove, store, transport and dispose of them.
 - .11 HEPA vacuum: DOP tested, High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.
 - .12 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
 - .13 Polyethylene: polyethylene sheeting or rip proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
 - .14 Occupied Area: any area of building or work site that is outside Asbestos Work Area.
 - .15 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for scope of work.
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- 1.4 ACTION AND INFORMATION SUBMITTALS**
- .1 Submit proof satisfactory to the Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
 - .2 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
 - .3 Submit proof of Contractor's Asbestos Liability Insurance.
 - .4 Submit to the Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.
 - .5 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
 - .6 Submit proof that supervisory personnel have attended asbestos abatement course, of not less than two days duration, approved by Departmental Representative. Minimum of one supervisor for every ten workers.
 - .7 Submit Worker's Compensation Board status and transcription of insurance.
 - .8 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
 - .1 Encapsulants;
 - .2 Amended water;
 - .3 Slow-drying sealer.
 - .9 Submit proof satisfactory to Departmental Representative that employees have appropriate respirator fitting and testing (fit test certificates). Workers must be fit tested (qualitative as a minimum for Half-face respirator, quantitative for Full-face respirator) with respirator that is personally issued.
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- .10 Asbestos abatement section within Hazardous Material Work Plan.

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.
- .2 Health and Safety:
 - .1 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
 - .1 As a minimum, air purifying respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.
 - .2 Disposable-type protective clothing (high-density polyethylene protective clothing (Tyvek or similar, as approved by the Departmental Representative) that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be

provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or replaced if torn.

- .3 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
- .4 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.
- .5 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.
- .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.
- .7 Visitor Protection:
 - .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
 - .2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.
 - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-

site bins for recycling in accordance with Waste Management Plan.

.3 Separate for reuse, and recycling and place in designated containers steel, metal, plastic waste in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.6 Fold up metal banding, flatten and place in designated area for recycling.

.7 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 0.15 mm thick bags or leak proof drums. Label containers with appropriate warning labels.

.8 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.7 EXISTING CONDITIONS

.1 Refer to the Specification Section 01 14 25 – Designated Substances for details on asbestos-containing materials.

.2 Notify Departmental Representative of asbestos-containing material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

1.8 SCHEDULING

.1 Hours of Work: perform work involving asbestos abatement located at the Building during hours specified by Departmental Representative.

1.10 PERSONNEL TRAINING

.1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.

- .2 Instruction and training related to respirators includes, at minimum:
 - .1 Fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
 - .3 Instruction and training must be provided by competent, qualified person.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Drop and Enclosure Sheets.
 - .1 Polyethylene: 0.15 mm thick.
 - .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
 - .2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in concentration to provide thorough wetting of asbestos-containing material.
 - .3 Asbestos waste containers: Metal or fibre - type acceptable to dump operator with tightly fitting covers and 0.15 mm minimum thickness sealable polyethylene liners.
 - .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.
 - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
 - .3 Label containers in accordance with applicable Regulations. Label in both official languages.
 - .4 Glove Bag: prefabricated glove bag as follows:
 - .1 Minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag.
 - .2 Integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elastic ports.
 - .3 Equipped with reversible, double-pull, double throw zipper on top and at approximately mid-section of the bag.
 - .4 Straps for sealing ends around pipe.
 - .5 Must incorporate internal closure strip if it is to be moved or used in more than one specific location.
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- .6 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .7 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
 - .1 Sealer: flame spread and smoke developed rating less than 50.
- .8 Encapsulant: penetrating type conforming to CAN/CGSB-1.205.

PART 3 - EXECUTION

3.1 SUPERVISION

- .1 Minimum of one Supervisor for every ten workers is required.
- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

3.2 PROCEDURES

- .1 Before beginning Work, at each access to Asbestos Work Area, install warning signs in both official languages in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: 'CAUTION ASBESTOS HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.
 - .2 Before beginning Work remove visible dust from surfaces in work area where dust is likely to be disturbed during course of work.
 - .1 Use HEPA vacuum, or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.
 - .2 Do not use compressed air to clean up or remove dust from any surface.
- .3 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
 - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in work areas where dust or contamination cannot otherwise be safely contained.
 - .2 Erect enclosure of polyethylene sheeting around indoor Type 2 work areas, shut off mechanical ventilation system serving work area, and seal ventilation ducts to and from work area.

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- .4 Remove loose material by HEPA vacuum; thoroughly wet friable material containing asbestos to be removed or disturbed before and during Work unless wetting creates hazard or causes damage.
 - .1 Use garden reservoir type low - velocity sprayer or airless spray equipment capable of producing mist or fine spray.
 - .2 Perform Work in a manner to reduce dust creation to lowest levels practicable.

 - .5 Pipe Insulation Removal Using Glove Bag:
 - .1 A glove bag not to be used to remove insulation from a pipe, duct or similar structure if:
 - .1 It may not be possible to maintain a proper seal for any reason including, without limitation:
 - .2 The condition of the insulation.
 - .3 The temperature of the pipe, conduit or similar element.
 - .4 The glove bag could become damaged for any reason including:
 - .1 The type of jacketing.
 - .2 The temperature of the pipe, duct or similar element.
 - .3 Upon installation of the glove bag, inspect bag for any damage or defects. If any damage or defects are found, the glove bag is to be repaired or replaced. The glove bag to be inspected at regular intervals for damage and defects, and repair or replaced, as appropriately. The asbestos containing contents of the damaged or defective glove bag found during removal are to be wetted and the glove bag and its contents are to be removed and disposed of in an appropriate waste disposal container. Any damaged or defective glove bags are not be re-used.
 - .4 Place tools necessary to remove insulation in tool pouch. Wrap bag around pipe and close zippers. Seal bag to pipe with cloth straps.
 - .5 Place hands in gloves and use necessary tools to remove insulation. Arrange insulation in bag to obtain full capacity of bag.
 - .6 Insert nozzle of garden reservoir type sprayer into bag through valve and wash down pipe and interior of bag thoroughly. Wet surface of insulation in lower section of bag.
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- .7 To remove bag after completion of stripping, wash top section and tools thoroughly. Remove air from top section through elasticized valve using a HEPA vacuum. Pull polyethylene waste container over glove bag before removing from pipe. Release one strap and remove freshly washed tools. Place tools in water. Remove second strap and zipper. Fold over into waste container and seal.
 - .8 After removal of bag ensure that pipe is free of residue. Remove residue using HEPA vacuum or wet cloths. Ensure that surfaces are free of sludge which after drying could release asbestos dust into atmosphere. Seal exposed surfaces of pipe and ends of insulation with slow drying sealer to seal in any residual fibres.
 - .9 Upon completion of Work shift, cover exposed ends of remaining pipe insulation with polyethylene taped in place.
- .6 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas at no additional costs to the Departmental Representative.
- .7 Clean-up:
- .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos-containing waste using HEPA vacuum or by damp mopping.
 - .2 Place dust and asbestos-containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
 - .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
 - .4 Seal and remove double-bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.
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- .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.3 AIR MONITORING

- .1 From beginning of Work until completion of cleaning operations, the Departmental representative may collect air samples on a daily basis outside of Asbestos Work Area enclosures.
- .2 If air monitoring shows that areas outside work area enclosures are contaminated, enclose, maintain, and clean these areas in same manner as that applicable to Asbestos Work Areas
 - .1 Stop work and clean areas outside of Asbestos Work Areas when Phased Contrast Microscopy measurements exceed 0.05 fibres per cubic centimeter (f/cc) and correct procedures.
 - .2 All required cleaning, re-cleaning, additional air testing and/or inspections will be performed at no extra charge to the Departmental Representative.
- .3 Ensure that respiratory safety factors for Workers are not exceeded.
- .4 The Departmental Representative may collect clearance/post-abatement air samples following a final visual inspection of the Asbestos Work Area by the Departmental Representative. Samples will be analyzed and compared to applicable regulations.
 - .1 Final air monitoring results must show fibre levels of less than 0.05 fibres per cubic centimeter (f/cc).
 - .2 If air monitoring shows that areas inside the Asbestos Work Area enclosures are contaminated; enclose, maintain and clean these areas in same manner as that applicable to Asbestos Work Area at no additional cost to the Departmental Representative.
 - .3 Repeat as necessary until fibre levels are less than 0.05 f/cc
 - .4 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS**
- .1 Section 01 14 25 – Designated Substances
 - .2 Section 02 82 00.02 – Asbestos Abatement: Intermediate Precautions
 - .3 Section 02 83 20 – Lead: Precautionary Measures
 - .4 Section 02 89 00 – Silica Precautionary Measures
- 1.2 REFERENCES**
- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.205-03, Sealer for Application to Asbestos-Fibre-Releasing Materials.
 - .2 Canadian Standards Association (CSA International).
 - .3 Department of Justice Canada.
 - .1 Canadian Environmental Protection Act (CEPA), 1999.
 - .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
 - .5 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
 - .6 Ontario Environmental Protection Act, R.R.O 1990,
 - .1 General – Waste Management, O. Reg 347/90, as amended.
 - .7 Underwriters' Laboratories of Canada (ULC).
 - .8 National Joint Council (NJC).
 - .1 Part XI – Hazardous Substances.
 - .9 Ontario Ministry of Labour (MoL).
 - .1 Occupational Health and Safety Act, R.S.O 1990, c. O1 (OSHA)
 - .1 O.Reg. 278/05 – Designated Substance – Asbestos
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on Construction Projects and in Buildings and Repair Operations, as amended.

.2 O.Reg. 490/09 – Designated Substances

.3 O.Reg. 213/91 - "Construction Projects", as amended

1.3 DEFINITIONS

- .1 Airlock: system for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two curtained doorways at least 2 m apart.
- .2 Amended Water: water with a non-ionic surfactant wetting agent added to reduce surface tension of water to allow wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs): materials that contain 0.5 percent or more asbestos by dry weight, identified under Existing Conditions Article, including fallen materials and settled dust.
- .4 Asbestos Work Area: Area where actual removal and sealing and enclosure of spray or trowel-applied asbestos-containing materials takes place.
- .5 Authorized Visitors: Departmental Representative, and representative(s) of regulatory agencies.
- .6 Competent worker: in relation to specific work, means a worker who:
 - .1 Is qualified because of knowledge, training and experience to perform the work.
 - .2 Is familiar with the provincial laws and with the provisions of the regulations that apply to the work.
 - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:
 - .1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.
 - .2 Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing.

- .3 Overlap each polyethylene sheet at openings not less than 1.5 m on each side.
 - .8 DOP Test: testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA filter leak test.
 - .9 Friable Material: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
 - .10 Hazardous Material Workplan: A brief report identifying the location and quantities of hazardous materials and the methods that will be used to remove, store, transport and dispose of them.
 - .11 HEPA vacuum: DOP tested, High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
 - .12 Negative pressure: DOP tested system that extracts air directly from work area, filters such extracted air through High Efficiency Particulate Air filtering system, and discharges this air directly outside work area to exterior of building.
 - .1 System to maintain minimum pressure differential of 5 Pa relative to adjacent areas outside of work areas, be equipped with alarm to warn of system breakdown, and be equipped with instrument to continuously monitor and automatically record pressure differences.
 - .13 Non-Friable Materials: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
 - .14 Occupied Area: any area of building or work site that is outside Asbestos Work Area.
 - .15 Polyethylene sheeting sealed with tape: Polyethylene sheeting of type and thickness specified sealed with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane to protect underlying surfaces from water damage or damage by sealants, and to prevent escape of asbestos fibres through sheeting into clean area.
 - .16 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.
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**1.4 ACTION AND
INFORMATIONAL SUBMITTALS**

- .1 Before beginning work:
- .1 Obtain from appropriate agency and submit to Departmental Representative necessary permits for transportation and disposal of asbestos waste. Ensure that dump operator is fully aware of hazardous nature of material being dumped, and proper methods of disposal. Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to receive and properly dispose of asbestos waste.
 - .2 Submit proof satisfactory to Departmental Representative that every worker involved in a Type 3 operation has successfully completed the Asbestos Abatement Worker Training Program approved by the Ministry of Training, Colleges and Universities and every supervisor of a worker involved in a Type 3 operation has successfully completed the Asbestos Abatement Supervisor Training Program approved by the Ministry of Training, Colleges and Universities as outlined in O. Reg. 278/05, s. 20 (1). Submit proof of attendance in form of certificate.
 - .3 Submit layout of proposed enclosures and decontamination facilities to Departmental Representative for review.
 - .4 Submit documentation including test results for sealer proposed for use.
 - .5 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
 - .6 Submit proof of Contractor's Asbestos Liability Insurance.
 - .7 Submit proof satisfactory to Departmental Representative that employees have appropriate respirator fitting and testing. Workers must be fit-tested (quantitative) with respirator that is personally issued.
 - .8 Submit Worker's Compensation Board status and transcription of insurance.
 - .9 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including but not limited to following:
 - .1 amended water;
 - .2 slow-drying sealer.
 - .10 Asbestos abatement section within Hazardous Material Work Plan.

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to asbestos, provided that in case of conflict among those requirements or with these specifications more stringent

requirement applies. Comply with regulations in effect at time work is performed.

- .2 Health and Safety:
 - .1 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area includes:
 - .1 As a minimum, full-face respirator equipped with HEPA P- 100 filter cartridges, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.
 - .2 Disposable-type protective clothing (high-density polyethylene protective clothing (Tyvek or similar, as approved by Client/Client Representative) that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or

- replaced if torn
- .2 Requirements for each worker:
 - .1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters that have been tested as satisfactory, clean coveralls and head covers before entering Equipment and Access Rooms or Asbestos Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.
 - .2 Remove gross contamination from clothing before leaving work area then proceed to Equipment and Access Room and remove clothing except respirators. Place contaminated work suits in receptacles for disposal with other asbestos - contaminated materials. Leave reusable items except respirator in Equipment and Access Room. Still wearing the respirator proceed naked to showers. Using soap and water wash body and hair thoroughly. Clean outside of respirator with soap and water while showering; remove respirator; remove filters and wet them and dispose of filters in container provided for purpose; and wash and rinse inside of respirator. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.
 - .3 After showering and drying off, proceed to clean change room and dress in street clothes at end of each day's work, or in clean coveralls before eating, smoking, or drinking. If re-entering work area, follow procedures outlined in paragraphs above.
 - .4 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers must not use this system as means to leave or enter work area.
 - .3 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.
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- .4 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual asbestos abatement.
- .5 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.
- .6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.
- .7 Visitor Protection:
 - .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
 - .2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.
 - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .3 Separate for reuse, and recycling and place in designated containers steel, metal, plastic waste in accordance with Waste Management Plan.
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .6 Fold up metal banding, flatten and place in designated area for recycling.

- .7 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.
- .8 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.7 EXISTING CONDITIONS

- .1 Refer to the following documents for details on asbestos containing materials:
 - .1 Refer to the Specification Section 01 14 25 – Designated Substances for details on asbestos-containing materials.
 - .2 Notify Departmental Representative of friable or any other suspect asbestos-containing material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.8 SCHEDULING

- .1 Not later than ten (10) days before beginning Work on this Project notify following in writing:
 - .1 Regional Office of Labour Canada.
 - .2 Provincial/Territorial, Department of Labour.
 - .3 Disposal Authority.
- .2 Inform sub-trades of presence of asbestos-containing materials identified in the Specification Section 01 14 25 – Designated Substances.
- .3 Submit to Departmental Representative copy of notifications prior to start of Work.
- .4 Hours of Work: perform work involving asbestos abatement located at the Building during hours specified by Departmental Representative. The work schedule must be approved in writing by the Departmental Representative in advance of work. Contractor shall be available to work continuously from beginning to end.

1.9 PERSONNEL TRAINING

- .1 Before beginning Work, provide to Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene

including dress and showers, in entry and exit from Asbestos Work Area, in aspects of work procedures, and in use, cleaning, and disposal of respirators and protective clothing.

- .2 Instruction and training related to respirators includes, at minimum:
 - .1 Proper fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Cleaning and Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.
- .4 Every worker involved in a Type 3 operation must have successfully completed the Asbestos Abatement Worker Training Program approved by the Ministry of Training, Colleges and Universities.
- .5 Every supervisor of a worker involved in a Type 3 operation must have successfully completed the Asbestos Abatement Supervisor Training Program approved by the Ministry of Training, Colleges and Universities.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Polyethylene: minimum 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
 - .2 FR polyethylene: minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.
 - .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.
 - .4 Wetting agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether, or other material approved by Departmental Representative mixed with water in concentration to provide adequate penetration and wetting of asbestos-containing material.
 - .5 Asbestos waste containers: Metal or fibre - type acceptable to dump operator with tightly fitting covers and 0.15 mm minimum
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thickness sealable polyethylene liners.

- .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.
- .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
- .3 Label containers in accordance with applicable Regulations. Label in both official languages.
- .6 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .7 Scaffolding: Of appropriate size and strength to accommodate project in accordance with O.Reg 213/91, with specifications and set-up to be approved and stamped by professional engineer. Include in contract sum costs due to this requirement.
- .8 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .9 Sealer: flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.
- .10 Encapsulant: penetrating type conforming to CAN/CGSB-1.205.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Work Areas:
 - .1 Shut off and isolate air handling and ventilation systems to prevent fibre dispersal to other building areas during work phase. Conduct smoke tests to ensure that duct work is airtight. Seal and caulk joints and seams of active return air ducts within Asbestos Work Area.
 - .2 Pre-clean moveable furniture and carpeting within proposed work area using HEPA vacuum and remove from work area to an appropriate temporary location.
 - .3 Pre-clean fixed casework, plant, and equipment within proposed work area(s), using HEPA vacuum and cover with polyethylene sheeting sealed with tape.
 - .4 Clean proposed work area(s) using, where practicable, HEPA vacuum cleaning equipment. If not practicable, use

wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum equipment.

- .5 The spread of dust from the work area to be prevented by:
 - .1 Using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls.
 - .2 Using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.
 - .6 DOP test negative pressure units within one (1) month prior to work operations. Provide documentation to Client Representative. Put negative pressure system in operation and operate continuously from time first polyethylene is installed to seal openings until final completion of work including final cleanup. Provide continuous monitoring of pressure difference using automatic recording instrument. The system to maintain a negative air pressure of 0.02 inches (5 Pa) of water, relative to the area outside the enclosed area. The system to be inspected and maintained by a competent person prior each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it to be replaced before the ventilation system is used. Vent negative air units to the outdoors.
 - .7 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
 - .8 Cover floor and wall surfaces with polyethylene sheeting sealed with tape. Use one layer of FR polyethylene on floors. Cover floors first so that polyethylene extends at least 300 mm up walls then cover walls to overlap floor sheeting.
 - .9 Build airlocks at entrances to and exits from work area(s) so that work area(s) are always closed off by one curtained doorway when workers enter or exit.
 - .10 At each access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used: "CAUTION ASBESTOS HAZARD AREA (25 mm) NO UNAUTHORIZED ENTRY (19 mm) WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY
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- HARM (7 mm)".
- .11 After work area isolation, remove heating, ventilating, and air conditioning filters, pack in sealed plastic bags 0.15 mm minimum thick and treat as contaminated asbestos waste. Remove ceiling - mounted objects such as lights, partitions, other fixtures not previously sealed off, and other objects that interfere with asbestos removal, as directed by Departmental Representative. Use localized water spraying during fixture removal to reduce fibre dispersal.
 - .12 Maintain emergency and fire exits from work area(s), or establish alternative exits satisfactory to Fire Commissioner of Canada.
 - .13 Where application of water is required for wetting asbestos-containing materials, shut off electrical power, provide 24-volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.
- .2 Worker Decontamination Enclosure System:
- .1 Worker Decontamination Enclosure System includes Equipment and Access Room, Shower Room, and Clean Room, as follows:
 - .1 Equipment and Access Room: build Equipment and Access Room between Shower Room and work area(s), with two curtained doorways, one to Shower Room and one to work area(s). Install portable toilet, waste receptor, and storage facilities for workers' shoes and protective clothing to be reworn in work area(s). Build Equipment and Access Room large enough to accommodate specified facilities, other equipment needed, and at least one worker allowing him /her sufficient space to undress comfortably.
 - .2 Shower Room: build Shower Room between Clean Room and Equipment and Access Room, with two curtained doorways, one to Clean Room and one to Equipment and Access Room. Provide one shower for every five workers. Provide hot and cold water or water of a constant temperature that is not less than 40°C or more than 50°C. Provide individual controls inside the room to regulate water flow, and individual controls inside room to regulate temperature. Provide piping and connect to water sources and drains. Pump wastewater through 5 micrometre filter system acceptable to Client Representative before directing into drains. Provide
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- soap, clean towels, and appropriate containers for disposal of used respirator filters.
- .3 Clean Room: build Clean Room between Shower Room and clean areas outside of enclosures, with two curtained doorways, one to outside of enclosures and one to Shower Room. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.
 - .3 Container and Equipment Decontamination Enclosure System:
 - .1 Container and Equipment Decontamination Enclosure System consists of Staging Area within work area, Washroom, Holding Room, and Unloading Room. Purpose of system is to provide means to decontaminate waste containers, scaffolding, waste and material containers, vacuum and spray equipment, and other tools and equipment for which Worker Decontamination Enclosure System is not suitable.
 - .1 Staging Area: designate Staging Area in work area for gross removal of dust and debris from waste containers and equipment, labelling and sealing of waste containers, and temporary storage pending removal to Washroom. Equip Staging Area with curtained doorway to Washroom.
 - .2 Washroom: build Washroom between Staging Area and Holding Room with two curtained doorways, one to Staging Area and one to Holding Room. Provide high – pressure low – volume sprays for washing of waste containers and equipment. Pump wastewater through 5 micrometre filter system before directing into drains. Provide piping and connect to water sources and drains.
 - .3 Holding Room: build Holding Room between Washroom and Unloading Room, with two curtained doorways, one to Washroom and one to Unloading Room. Build Holding Room sized to accommodate at least two waste containers and largest item of equipment used.
 - .4 Unloading Room: build Unloading Room between Holding Room and outside, with two curtained doorways, one to Holding Room and one to outside.
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- .4 Construction of Decontamination Enclosures:
 - .1 Build suitable framing for enclosures or use existing rooms where convenient, and line with polyethylene sheeting sealed with tape. Use one layer of FR polyethylene on floors, as applicable.
 - .2 Build curtained doorways between enclosures so that when people move through or when waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.

 - .5 Separation of Work Areas from Occupied Areas:
 - .1 Separate parts of building required to remain in use from parts of building or exterior used for asbestos abatement by means of airtight barrier system constructed as follows:
 - .1 Build suitable floor to ceiling lumber or metal stud framing, cover with polyethylene sheeting sealed with tape, and apply 9 mm minimum thick plywood. Seal joints between plywood sheets and between plywood and adjacent materials with surface film forming type sealer, to create airtight barrier.
 - .2 Cover plywood barrier with polyethylene sealed with tape, as specified for work areas.

 - .6 Maintenance of Enclosures:
 - .1 Maintain enclosures in tidy condition.
 - .2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
 - .3 Visually inspect enclosures at beginning of each working period.
 - .4 Use smoke methods to test effectiveness of barriers when directed by Departmental Representative.

 - .7 Do not begin Asbestos Abatement work until:
 - .1 Arrangements have been made for disposal of waste.
 - .2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of wastewater.
 - .3 Work area(s) and decontamination enclosures and parts of building required to remain in use are effectively segregated.
 - .4 Tools, equipment, and materials waste containers are on hand.
 - .5 Arrangements have been made for building security.
 - .6 Warning signs are displayed where access to
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contaminated areas is possible.

- .7 Notifications have been completed and other preparatory steps have been taken.
- .8 Work area enclosure has been inspected and approved by the Departmental Representative.
- .9 Locations for waste bins as designated by the Departmental Representative have been established. Keep bins covered and enclosed while at the site. Bin loading area shall be kept clean at all times.

3.2 SUPERVISION

- .1 Minimum of one Supervisor for every ten workers is required.
- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

3.3 ASBESTOS REMOVAL

- .1 Remove asbestos-containing materials as required to accommodate project scope of work.
 - .2 Before removing asbestos:
 - .1 Prepare site.
 - .2 Spray asbestos material with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.
 - .3 Remove saturated asbestos material in small sections. Do not allow saturated asbestos to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.
 - .4 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure that containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.
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- .5 After completion of stripping work, wire brushed and wet-sponged surfaces from which asbestos has been removed to remove visible material. During this work keep surfaces wet.
 - .6 After wire brushing and wet sponging to remove visible asbestos and after encapsulating asbestos containing material impossible to remove, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24-hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24-hour period under same conditions, clean these areas and objects again using HEPA vacuum followed by wet cleaning. After inspection by Departmental Representative or designate, apply continuous coat of slow drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period.
 - .7 Work is subject to visual inspection and air monitoring by Departmental Representative. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
 - .8 Cleanup:
 - .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.
 - .2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
 - .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
 - .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.
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- .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.4 INSPECTION

- .1 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviation(s) from these requirements that have not been approved in writing by the Departmental Representative may result in Work stoppage, at no cost to the Departmental Representative.
- .2 Departmental Representative will inspect Work for:
 - .1 Adherence to specific procedures and materials.
 - .2 Final cleanliness and completion.
 - .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
- .3 When asbestos leakage from Asbestos Work Area has occurred or is likely to occur, Departmental Representative may order Work shutdown.
- .4 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 AIR MONITORING

- .1 From beginning of Work until completion of cleaning operations, Departmental Representative will collect air samples on daily basis outside of work area enclosure(s) in accordance with industry standard practice.
 - .1 Contractor shall be responsible for monitoring inside in accordance with applicable Provincial/Territorial Occupational Health and Safety Regulations.
 - .2 Contractor shall ensure that respiratory safety factors for Workers are not exceeded.
- .2 If air monitoring shows that areas outside work area are contaminated, enclose, maintain and clean these areas in same manner as that applicable to Asbestos Work Areas.
 - .1 Stop work and clean areas outside of Asbestos Work Areas when Phase Contrast Microscopy measurements exceed 0.05 fibres per cubic centimetre (f/cc) and correct procedures.

- .2 All required cleaning, re-cleaning, additional air testing and/or inspections will be at no extra charge to Departmental Representative.
- .3 Final air monitoring to be conducted as follows: After Asbestos Work Area has passed visual inspection by Departmental Representative, and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period has passed, Departmental Representative will perform aggressive air monitoring within Asbestos Work Area.
 - .1 Final air monitoring results must show fibre levels of less than 0.01 f/cc.
 - .2 If air monitoring results show fibre levels in excess of 0.01 f/cc, re-clean work area and apply another acceptable coat of lock-down agent to surfaces.
 - .3 Repeat as necessary until fibre levels are less than 0.01 f/cc.
 - .4 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.6 FINAL CLEANUP

- .1 Following cleaning and air sampling by Departmental Representative shows that asbestos levels inside work area enclosure(s) do not exceed 0.01 fibres/cc, proceed with final cleanup.
 - .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible asbestos-containing particles observed during cleanup, immediately, using HEPA vacuum equipment.
 - .3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.
 - .4 Include in clean-up Work areas, Equipment and Access Room, Washroom, Shower Room, and other contaminated enclosures.
 - .5 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.
 - .6 Conduct final check to ensure that no dust or debris remains on surfaces as result of dismantling operations.
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- .7 As work progresses, and to prevent exceeding available storage capacity on site, remove sealed and labelled containers containing asbestos waste and dispose of at authorized disposal area in accordance with requirements of disposal authority. Ensure that each shipment of containers transported to dump is accompanied by Contractor's representative to ensure that dumping is done in accordance with governing regulations.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS**
- .1 Section 01 14 25 – Designated Substances
 - .2 Section 02 82 00.02 – Asbestos Abatement: Intermediate Precautions
 - .3 Section 02 82 00.03 – Asbestos Abatement: Maximum Precautions
 - .4 Section 02 89 00 – Silica Precautionary Measures
- 1.2 REFERENCES**
- .1 Department of Justice Canada.
 - .1 Canadian Environmental Protection Act (CEPA), 1999.
 - .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
 - .3 Transport Canada (TC).
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
 - .4 Ontario Ministry of Environment (MoE).
 - .1 R.R.O. 1990, Reg. 347, General – Waste Management, as amended.
 - .5 Ontario Ministry of Labour (MoL).
 - .1 Occupational Health and Safety Act, R.S.O. 1990, c. O.1 (OHSA).
 - .1 O.Reg. 213/91, Construction Projects.
 - .2 R.R.O. 1990, Regulation 490/09, “Designated Substances”.
 - .2 Guideline: Lead on Construction Projects, September 2004, as revised.
 - .6 Canada Consumer Product Safety Act Surface Coating Materials Regulations SOR/2005-109, as amended.
- 1.3 DEFINITIONS**
- .1 Airlock: system for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two curtained
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- doorways at least 2 m apart unless Site Conditions dictate otherwise.
- .2 Authorized Visitors: Departmental Representatives or designated representatives, and representatives of regulatory agencies.
 - .3 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed by placing two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway. Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing. Overlap each polyethylene sheet at openings not less than 1.5 m on each side unless Site Conditions dictate otherwise.
 - .4 Hazardous Material Workplan: A brief report identifying the location and quantities of hazardous materials and the methods that will be used to remove, store, transport and dispose of them.
 - .5 Lead-Containing Paint: Paint that contains detectable concentrations of lead and concentrations that may result in elevated airborne lead exposure during operations that disturb the paint.
 - .6 Lead-containing materials: Materials that are assumed to contain varying levels of lead from their historic composition.
 - .7 Lead-containing equipment: Equipment suspected of containing lead through historic application, or identified as lead containing through labels/tags.
 - .8 Occupied Area: any area of building or work site that is outside the Lead Work Area.
- 1.4 ACTION AND INFORMATION SUBMITTALS**
- .1 One (1) week prior to the start of abatement work, submit proposed methodology for abatement procedures for review by Departmental Representative. The proposed methodology shall include:
 - .1 Products to be used complete with MSDS information.
 - .2 List of protective equipment to be used by workers.
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- .3 Plan identifying area(s) of work for abatement procedures.
 - .4 Requirements for engineering controls, ventilation, etc.
 - .5 Requirements for access to and egress from the Lead Work Area.
- .2 A written Health and Safety Plan specific to work of this Section. As a minimum this document must include:
- .1 Classification of all lead abatement work in accordance with the criteria used in the document Guideline: Lead on Construction Projects issued by the Ontario Ministry of Labour.
 - .2 The identity of the "competent person" who will, on behalf of the Contractor, perform regular inspections of the lead abatement activities to prevent dangerous, unhealthy or unsafe conditions. The "competent person" must be on site at all times while lead abatement activities are in progress.
 - .3 A description of the equipment and materials, controls, crew size, job responsibilities, and operations and maintenance procedures for each activity involved in the work of this Section.
 - .4 A description of the specific control methods to be used in the lead- containing paint and surface coatings abatement processes.
 - .5 A strategy to ensure that personnel are not exposed to airborne lead or other contaminants in concentrations that exceed the current Time Weighted Average Exposure Value (TWAEV).
 - .6 A description of the medical surveillance program in place for lead abatement workers.
 - .7 Names of products to be used in lead abatement work.
- .3 Before beginning work:
- .1 Obtain from appropriate agency and submit to Departmental Representative all necessary permits for transportation and disposal of lead-containing waste. Ensure that dump operator is fully aware of hazardous nature of material being dumped, and proper methods of disposal.
 - .2 Submit proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, use of showers, entry and exit from work areas, and aspects of work procedures and protective measures.
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- .3 Submit proof in the form of a certificate that supervisory personnel have attended a lead-containing paint abatement course, of not less than 1-day duration.
- .4 For each load of waste that leaves the site, submit landfill weigh scale receipts, shipping documents, and lead-containing waste manifests, as applicable based upon waste characterization.
- .5 Lead abatement section within Hazardous Material Work Plan.

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
 - .1 Safety Requirements: worker and visitor protection.
 - .1 Eating, drinking, chewing, and smoking are not permitted in the Lead Work Area.
 - .2 Washing facilities consisting of a wash basin, water, soap and towels shall be provided by the Contractor. All workers shall use these washing facilities before eating, drinking, smoking or leaving the work site. Washing facility areas are to be designated by Departmental Representative
 - .3 Protective equipment and clothing to be worn by workers while in the Lead Work Area includes:
 - .1 Disposable-type protective clothing that does not readily retain or permit penetration of lead dust, consisting of full- body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.
 - .2 Respirator, personally issued to worker and marked as to efficiency and purpose, and acceptable to Authority having jurisdiction as suitable for level of lead exposure in the Lead Work Area. If disposable type filters are used, provide sufficient filters so that workers can install new filters following disposal of used filters and before re- entering contaminated areas.
 - .4 Ensure that no person required to enter the Lead Work Area has facial hair that affects seal between respirator and face.

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- .5 Visitor Protection:
 - .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
 - .2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.
 - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from the Lead Work Area.
- 1.6 WASTE MANAGEMENT AND DISPOSAL**
- .1 Representative sampling of lead-containing materials that is representative of the applicable waste stream (i.e. sampling to include substrate material as applicable) shall be performed by a competent person retained by the Contractor prior to disposal of lead-containing materials. Lead-containing waste streams are to be classified for disposal purposes using the Toxicity Characteristic Leachate Procedure at a certified analytical laboratory. All sampling procedures and submissions shall be approved of by the Departmental Representative.
 - .2 Place materials characterized as hazardous or toxic based upon leachate analysis in designated containers.
 - .3 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
 - .4 Disposal of lead waste, including wash and rinse water, generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Label containers with appropriate warning labels.
 - .5 Provide manifests describing and listing waste created. Transport containers by approved means to licensed facility for disposal.
- 1.7 EXISTING CONDITIONS**
- .1 Refer to the Specification Section 01 14 25 – Designated Substances for details on lead-containing materials.
- PART 2 - PRODUCTS**
- 2.1 MATERIALS**
- .1 All materials brought to project site must be in good condition and free of lead dust. Disposable items must be of new materials only.
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- .2 Lead Waste Container: An impermeable container acceptable to disposal site and Ministry of Environment. Labelled as required. Comprised of one of the following:
 - .1 A 0.15 mm sealed polyethylene bag, inside a second 0.15 mm sealed polyethylene bag.
 - .2 A barrel suitable for lead wash water and/or sludge. Container must be acceptable to the waste hauler.
- .3 Lead Cleaning Agent: A cleaning agent suitable for lead dust. Acceptable products:
 - .1 Detergents with a high phosphate content (containing at least 5% trisodium phosphate).
 - .2 Phosphate-free lead dissolving agent.
- .4 FR polyethylene: minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.
- .5 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions.

2.2 EQUIPMENT

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Sprayer: Garden reservoir type, low velocity, capable of producing a mist or fine spray.

PART 3 - EXECUTION

3.1 ABATEMENT WORK AREA PREPARATION

- .1 Implement lead precautionary measures appropriate to the work completed in accordance with MOL Guideline: Lead on Construction Projects, as amended.
- .2 Type 1 Work Areas:
 - .1 Install polyethylene drop sheets below lead operations which produce or may produce dust, chips, or debris containing lead.
- .3 Type 2 Work Areas:
 - .1 Install polyethylene drop sheets below lead operations which produce or may produce dust, chips, or debris containing lead.

- .2 Post signs in sufficient numbers to warn of the lead hazard. There shall be a sign, at least, at each entrance to the Lead Work Area. The signs shall display the following information in large, clearly visible letters using both official languages:
 - .1 Lead dust, fume or mist hazard.
 - .2 Access to the work area is restricted to authorized persons.
 - .3 Respirators must be worn in the work area.

- .4 Type 3 Work Areas:
 - .1 Post signs in sufficient numbers to warn of the lead hazard. There shall be a sign, at least, at each entrance to the Lead Work Area. The signs shall display the following information in large, clearly visible letters using both official languages:
 - .1 Lead dust, fume or mist hazard.
 - .2 Access to the work area is restricted to authorized persons.
 - .3 Respirators must be worn in the work area.
 - .2 Barriers, Partial Enclosures and Full Enclosures: Barriers, partial enclosures, and full enclosures shall be constructed to separate the Lead Work Area from the rest of the project. Barriers shall only be used where full and partial enclosures are not practical.
 - .1 Barriers:
 - .1 Ropes or barriers do not prevent the release of contaminated dust or other contaminants into the environment. However, they can be used to restrict access of workers who are not adequately protected with proper PPE, and also prevent the entry of workers not directly involved in the operation. Ropes or barriers shall be placed at a distance far enough from the operation that allows the lead-containing dust to settle. If this is not achievable, warning signs should be posted at the distance where the lead-containing dust settles to warn that access is restricted to persons wearing PPE.
 - .2 Partial Enclosures:
 - .1 Partial enclosures allow some emissions to the atmosphere outside of the enclosure. Partial enclosures may consist of vertical tarps and floor tarps so long as the tarps are overlapped and securely fixed together at the seams. A partial enclosure is not a suitable containment

system if significant dust is being generated.

- .3 Full Enclosures:
 - .1 Full enclosures are tight enclosures (with tarps that are generally impermeable and fully sealed joints and entryways). Full enclosures allow minimal or no fugitive emissions to reach the environment outside of the Lead Work Area. For full enclosures, the following requirements shall be met:
 - .1 The enclosure shall be constructed of windproof materials that are impermeable to dust.
 - .2 The enclosure shall be supported by a secure structure.
 - .3 All joints in the enclosure shall be fully sealed.
 - .4 Entrances to the enclosure shall be equipped with air locks.
 - .5 The escape of abrasive and debris from the enclosure shall be controlled, at air supply points, by the use of baffles, louvers, flap seals and filters.
 - .3 Worker Decontamination Enclosure System: Worker Decontamination Enclosure System includes Equipment and Access Room, Shower Room, and Clean Room, as follows:
 - .1 Construct Worker Decontamination Enclosure System as close to the work area as possible in area specified by Departmental Representative. Submit layout of proposed enclosures and decontamination facilities including location to Departmental Representative for review.
 - .2 Equipment and Access Room: build an Equipment and Access Room between Shower Room and Lead Work Area, with two curtained doorways, one to Shower Room and one to Lead Work Area. Install a waste receptor and storage facilities for workers' shoes and protective clothing to be reworn in Lead Work Area. Build Equipment and Access Room large enough to accommodate specified facilities, other equipment needed, and at least one worker allowing him /her sufficient space to undress comfortably.
 - .3 Shower Room: build a Shower Room between Clean Room and Equipment and Access Room, with two curtained doorways, one to Clean Room and one to Equipment and Access Room. Provide
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- one shower for every five or fewer workers. Provide constant supply of hot and cold, or warm (between 40°C and 50°C) potable water. Provide piping and connect to water sources and drains. Provide soap, clean towels, and appropriate containers for disposal of used respirator filters.
- .4 Clean Room: build a Clean Room between Shower Room and clean areas outside of enclosures, with two curtained doorways, one to outside of enclosures and one to Shower Room. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install a mirror to permit workers to fit respiratory equipment properly.
 - .4 Maintenance of Enclosures:
 - .1 Maintain enclosures in tidy condition.
 - .2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
 - .3 Visually inspect enclosures at beginning of each working period.
 - .5 Do not begin lead abatement work until:
 - .1 Arrangements have been made for disposal of lead-containing waste.
 - .2 Arrangements have been made for containing, filtering, testing and disposal of wastewater.
 - .3 Work areas, decontamination enclosures and parts of project site required to remain in use are effectively segregated.
 - .4 Tools, equipment, and materials waste containers are on hand.
 - .5 Arrangements have been made for building security.
 - .6 Warning signs are displayed where access to contaminated areas is possible.
 - .7 Notifications have been completed and other preparatory steps have been taken.
 - .8 Departmental Representative has reviewed preparatory work and provided written approval for lead abatement work to proceed.
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3.2 SUPERVISION

- .1 Minimum of one Supervisor for every ten or fewer workers is required.
- .2 Approved Supervisor must remain within Lead Work Area during disturbance, removal, or other handling of lead-containing paint and other lead contaminated materials.

3.3 LEAD REMOVAL

- .1 The removal or disturbance of asbestos-containing materials coated with lead- containing coatings must also be performed using appropriate asbestos and/or silica precautions as outlined in the relevant Section, as applicable.
 - .1 Section 02 82 00.02 – Asbestos Abatement: Intermediate Precautions
 - .2 Section 02 82 00.03 – Asbestos Abatement: Maximum Precautions
 - .3 Section 02 89 00 – Silica Precautions
- .2 Before removing lead-containing paint or disturbing other lead containing or contaminated materials:
 - .1 Prepare site.
 - .2 Spray surfaces to be disturbed, that are finished with lead-containing paint, with water using airless spray equipment capable of providing a “mist” application to prevent the release of dust.
- .3 Lead-containing paint and surface coating removal:
 - .1 Methods of lead-containing paint and surface coating removal that may be used, pending approval from the Departmental Representative, include:
 - .1 Method(s) at the sole discretion of the Departmental Representative.
- .4 At completion of lead-containing paint and surface coatings removals, perform the following clean-up:
 - .1 Wait at least 1-hour after active lead abatement work has ceased to allow airborne lead particles to settle.
 - .2 HEPA vacuum all surfaces within the Lead Work Area. Start vacuuming at the highest levels furthest from the Decontamination Facilities and work progressively downwards towards the Decontamination Facilities.
 - .3 Wash all surfaces with Lead Cleaning Agent and rinse with clean water. Start washing and rinsing at the highest levels furthest from the Decontamination Facilities and work progressively downwards towards the Decontamination

Facilities.

- .4 Repeat HEPA vacuuming, washing and rinsing as required to achieve clearance criteria.

3.4 INSPECTION

- .1 Perform inspections of Lead Work Area to confirm compliance with specification and requirements of authorities having jurisdiction. Deviation from these requirements that have not been approved in writing by the Departmental Representative may result in Work stoppage, at no cost to Departmental Representative.
- .2 Departmental Representative will inspect Work for:
 - .1 Adherence to specific procedures and materials.
 - .2 Final cleanliness and completion.
 - .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
- .3 When a leakage of liquid, dust or fume from the Lead Work Area has occurred or is likely to occur the Departmental Representative Construction Manager may order Work shutdown.
 - .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 AIR MONITORING AND SURFACE WIPE SAMPLING

- .1 From beginning of Work until completion of cleaning operations, the Departmental Representative may be on site to collect air samples either inside or outside of the Lead Work Area in accordance with standard methods for workplace air sampling and analysis.
 - .1 This air monitoring does not relieve the Contractor of any responsibility for air monitoring inside the Lead Work Area to verify that the respiratory protection in use provides a suitable protection factor.
- .2 Use results of air monitoring inside the Lead Work Area to establish type of respirators to be used. Workers may be required to wear sample pumps for up to full-shift periods.
 - .1 If airborne lead concentrations are above the protection factor of respirators in use, the Contractor shall:
 - .1 Stop abatement.
 - .2 Introduce more stringent engineering controls.
 - .3 Use a higher protection factor in respiratory protection for persons inside the Lead Work Area.

- .2 If air monitoring shows that airborne lead concentrations outside the Lead Work Area exceed 0.025 mg/m³, the Contractor shall maintain and clean these areas, in same manner as applicable to the Lead Work Area, at no additional cost to the Departmental Representative.
- .3 Final clearance air monitoring will be performed at the sole discretion of the Departmental Representative.
 - .1 Final air monitoring results must show airborne lead levels less than 0.005 mg/m³.
 - .2 If air monitoring results show airborne lead levels in excess of 0.005 mg/m³, the Contractor shall re-clean the Lead Work Area at no additional cost to the Departmental Representative or Departmental Representative.
 - .3 Repeat as necessary until airborne lead levels are less than 0.005 mg/m³.
- .4 The following criteria shall be used to define an acceptable level of cleanliness after lead abatement activities:
 - .1 Where removal of paints and other surface coatings has been performed to accommodate the project scope of work:
 - .1 Visibly free of paint(s), primer(s), and surface coating(s), and/or associated dust.
 - .2 Residual lead dust concentration less than:
 - .1 430 micrograms/square metre for interior floor surfaces
 - .2 2,691 micrograms/square metre for interior windowsills
 - .3 8,611 micrograms/square metre for exterior surfaces
 - .4 Repeat cleaning as necessary until lead concentrations are below specified levels, at no additional cost to the Departmental Representative.

3.6 FINAL CLEANUP

- .1 Remove polyethylene sheet by rolling it towards the centre of the Lead Work Area. Immediately vacuum any visible paint chips, particles, dust and debris observed during cleanup using HEPA vacuum equipment.
 - .2 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in sealed labelled waste containers for transport.
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- .3 Include in clean-up Work areas, Equipment and Access Room, Shower Room, and other contaminated enclosures.
- .4 Include in clean-up sealed waste containers and equipment used in Work and remove from work areas, at appropriate time in cleaning sequence.
- .5 A final check may be carried out to ensure that no lead dust or debris remains on surfaces as a result of dismantling operations.
- .6 As work progresses, and to prevent exceeding available storage capacity on site, remove sealed and labelled waste containers.
 - .1 Dispose of lead-containing waste in accordance with R.R.O. 1990, Regulation 347/90, as amended. Ensure that waste hauler and receiver are fully aware of hazardous nature of material to be disposed of and that guidelines and regulations for lead-containing waste disposal are followed.
 - .2 Ensure that materials removed during the Work of this Section are treated, packaged, transported and disposed of as lead-containing waste.
 - .3 Clean up waste routes and loading area after each load. Use lead abatement procedures if appropriate or requested by Departmental Representative.
 - .4 Drop garbage bins at designated locations. Keep bins covered and enclosed while at the site. Bin loading area shall be kept clean at all times.
- .5 Transport all waste to a landfill licensed by the Ontario Ministry of Environment (MOE).
- .6 Provide Departmental Representative with copies of shipping documents and lead-containing waste manifests for each load of waste. The Contractor is responsible to ensure that written documentation is submitted for each load of waste leaving the site.
- .7 Cooperate with MOE inspectors and immediately carry out instructions for remedial work at landfill to maintain environment, at no additional cost to the Departmental Representative.

END OF SECTION

PART 1 - GENERAL

- 1.1 RELATED SECTIONS**
- .1 Section 01 14 25 – Designated Substances
 - .2 Section 02 82 00.02 – Asbestos Abatement: Intermediate Precautions
 - .3 Section 02 82 00.03 – Asbestos Abatement: Maximum Precautions
 - .4 Section 02 83 20 – Lead Precautionary Measures
- 1.2 REFERENCES**
- .1 Comply with current Federal, Provincial, and local requirements pertaining to silica, provided that in case of conflict among these requirements or with these specifications the more stringent requirement applies. Comply with regulations in effect at time work is performed.
 - .2 Federal Legislation
 - .1 Canada Labour Code and associated regulations.
 - .3 Provincial legislation
 - .1 Ontario Occupational Health and Safety Act, R.S.O. 1990, Regulation 490/09 "Designated Substances".
- 1.3 DEFINITIONS**
- .1 Dangerous Goods: product, substance, or organism that is specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
 - .2 Hazardous Material: product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
 - .3 Hazardous Material Workplan: A brief report identifying the location and quantities of hazardous materials and the methods that will be used to remove, store, transport and dispose of them.
 - .1 Workplace Hazardous Materials Information System (WHMIS): Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.
- 1.4 SUBMITTALS**
- .1 Silica abatement section within Hazardous Material Work Plan.
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**1.5 PRECAUTIONARY MEASURES
AND PROCEDURES**

- .1 Execute work by methods to minimize raising silica dust from demolition operations. Where practical, wet methods or a dust collection system should be used to reduce dust.
- .2 Adequate ventilation, including local exhaust ventilation, should be maintained to prevent the accumulation and recirculation of harmful concentrations of free crystalline silica in the work area.
- .3 As practical, processes that generate silica dust should be completed in enclosed areas wherever possible to prevent the spread of silica dust outside of the work area.
- .4 Implement and maintain silica dust control measures during work to ensure that silica levels do not exceed allowable limits.
- .5 Departmental Representative may stop work at any time when release of silica dust to adjacent area is suspected. Contractor must discuss procedures that Contractor proposes to resolve problem. Make all necessary changes to operations prior to resuming any demolition activities that may cause release of silica dust at no extra cost to the Departmental Representative.
- .6 Silica dust should be cleaned from machinery and work surfaces by wet sweeping, the use of sweeping compounds or vacuum cleaners fitted with a HEPA filter to prevent the recirculation of dusty air. Cleaning methods such as blowing with compressed air or dry sweeping should be avoided. Where exposure to free crystalline silica occurs, protective work clothing should be vacuumed before removal.
- .7 Store material containing silica dust in closed containers or use other appropriate means to prevent dust from becoming airborne.

**1.6 PERSONAL PROTECTIVE
EQUIPMENT**

- .1 Anticipated minimum levels of personal protection based on work activity involving silica dust are listed below and are in addition to the personal protective equipment required for the completion of the demolition activities. Personal protection are dependent on the work practices and associated silica exposure risks.
 - .1 Air purifying half-mask respirator equipped with HEPA filter cartridges or supplied-air type, personally issued to the worker and marked as to efficiency and purpose, and acceptable to the Provincial Authority having jurisdiction as suitable for silica and the level of silica exposure in the Work Area. If disposable type filters are used, provide sufficient filters so that workers can install new filters following disposal of used filters and before re-entering contaminated areas.

- .2 Eye Protection: Goggles, Safety glasses with side shields, or Face shield.
- .3 If requested by a worker,
 - .1 Hand Protection: Gloves
 - .2 Clothing: Full body protective clothing

1.7 AIR MONITORING

- .1 If air monitoring shows that work areas contain crystalline silica above the specified action levels, these areas shall be cleaned by previously outlined methods at no additional cost to the Departmental Representative.

1.8 PERMITS

- .1 Contractor is responsible to obtain all necessary permits, licenses and approvals to conduct the abatement (e.g. Ontario Ministry of the Environment (MOE) waste generating number, etc.).

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not used.

END OF SECTION

PART 1 – GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A36/A36M-19, Specification for Structural Steel.
 - .2 ASTM A123/A123M-17, Standard Specifications for Zinc (Hot-Dip).
 - .3 ASTM A 307-14e1, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - .4 ASTM A325, Specification for Structural Bolts, Steel. Heat Treated 830 MPa Minimum Tensile Strength
- .2 American National Standards Institute (ANSI)/American Society of Mechanical Engineers International (ASME)
 - .1 ANSI/ASME B16.15-18, Cast Copper Alloy Threaded Fittings: Classes 125 and 250.
 - .2 ASTM B88M-20, Standard Specification for Seamless Copper Water Tube (Metric).
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-85.10-99, Protective Coatings for Metals.
- .4 Canadian Standards Association (CSA International)
 - .1 CAN/CSA G40.20/G40.21-13(R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA-S16-19, Design of Steel Structures.

1.2 DESIGN REQUIREMENTS

- .1 Design details and connections in accordance with requirements of CAN/CSA-S16 to resist forces, moments, and shears.

1.3 SHOP DRAWINGS

- .1 Submit shop drawings/manufacturer's design information including fabrication documents and materials list in accordance with Division 1.
 - .1 Verify site conditions and dimensions on site before shop drawing preparation. Show all on shop drawings.
 - .2 Erection drawings: indicate details and information necessary for assembly and erection purposes including:
 - .1 Materials list and quantification
 - .2 Description of methods.
 - .3 Sequence of erection.
 - .4 Type of equipment used in erection.
 - .5 Temporary bracings.
 - .6 Connections.

PART 2 – PRODUCTS

2.1 MATERIALS

- .1 Structural steel: to CAN/CSA-G40.20/G40.21 Grade 350W, unless

otherwise noted on drawings. All steel components shall be hot dip galvanized: galvanize steel to ASTM A123/A123M, minimum zinc coating of 600 g/m², Coating Grade 85.

- .2 Steel Pans: Manufactured rolled sections in accordance with CSA G40.21 – 305W.
 - .3 Adhesive Anchors: Manufacturer to be approved prior to start of work. Provide full submittal package to Departmental Representative for approval prior to completing the work. Concrete adhesive anchor systems must be comprised of adhesives that meet the following specifications:
 - .1 Injectable, two-component, fast-cure hybrid adhesive that has been tested in accordance with ACI 308 for use in cracked and uncracked concrete and under seismic loading.
 - .2 Adhesive may be used with continuously threaded rods, externally threaded inserts, steel reinforcing bars, and specialty fluted threaded rods.
 - .4 Adhesive Anchor Rods must meet the following specifications:
 - .1 Grade 36:
 - .1 Continuously threaded carbon steel rod compliant with ASTM F1554 Grade 36 with a 0.0002-in-thick (0.005mm) zinc electroplated coating complying with ASTM B633 SC 1.
 - .2 The steel rod must be straight, free of indentations and stamped with an identifying mark (identifying steel grade and length) with the imbedded end cut on the bias to a chisel point.
 - .3 Threaded rod shall be supplied with an ASTM A563 Grade A nut and an ASTM F436 Type 1 washer.
 - .2 Grade 55:
 - .1 Continuously threaded carbon steel rod compliant with ASTM F1554 Grade 55 with a 0.0002-in-thick (0.005mm) zinc electroplated coating.
 - .2 The steel rod must be straight, free of indentations and stamped with an identifying mark (identifying steel grade and length) with the imbedded end cut on the bias to a chisel point.
 - .3 Threaded rod shall be supplied with an ASTM A563 Grade A nut and an ASTM F436 Type 1 washer.
 - .5 Adhesive anchoring system must be approved for use with
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three-hole cleaning options:

- .1 Traditional hole cleaning using steel wire brushes and compressed air;
 - .2 Self-cleaning method with an approved hollow drill bit and vacuum that will remove the dust during the drilling process, automatically cleaning the hole;
 - .3 No-cleaning method when used in conjunction with a specialized fluted threaded rod in dry conditions with hammer drilled holes.
- .6 Copper Drain Fittings for Drip Pans:
- .1 Copper tube, hard drawn, type M: to ASTM B88M.
 - .2 Cast copper, solder type: to ANSI/ASME B16.18.
 - .3 Wrought copper and copper alloy, solder type: to ANSI/ASME B16.22.
 - .4 Rubber gaskets, latex-free, 1.6 mm thick.

2.2 FABRICATION

- .1 Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with reviewed shop drawings.
- .2 Fabricate work square, true, straight, and accurate to required size, with joints closely fitted and properly secured as per structural drawings.
- .3 Continuously seal members by continuous welds, unless otherwise indicated. Grind smooth.
- .4 Where possible, fit and shop assemble work, ready for erection.

PART 3 – EXECUTION

3.1 GENERAL

- .1 Structural steel work: in accordance with CAN/CSA-S16.
 - .2 Provide site measurements at each new soffit drip pan location prior to fabrication, including size of drip pan required to cover deteriorated area, and the quantity of hangers required to meet the minimum dimensional requirements noted in the project drawings. Note any changes to the drip pan summary shown on the project drawings for review and approval by Departmental Representative.
 - .3 Fabricate and install new drip pans, hangers and drain plumbing appurtenances to meet the minimum dimensional requirements shown on the project drawings, and to meet the intention of the repair which is to cover all indicated deteriorated or leaking areas with a new drip pan.
 - .4 Evaluate all sprinkler line hanger anchor locations throughout
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- the garage and mark out all deteriorated locations. Deteriorated includes cracked, spalled or loose anchors. Manually manipulate each anchor to check for loose connections. Notify Departmental Representative for review of results.
- .5 Upon acceptance of mark outs by Departmental Representative, replace the deteriorated hanger anchors as per the project drawings. Assume 50 locations (unit rate item to be confirmed by site evaluation).
- 3.2 CONNECTION TO EXISTING WORK** .1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative for direction before commencing fabrication.
- 3.3 ERECTION**
- .1 Erect steel, as indicated and in accordance with CAN/CSA-S16.
- .2 Field cutting or altering structural members: to approval of Departmental Representative in writing.
- .3 Clean with mechanical brush and touch up zinc finish to pans, bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- .4 Continuously seal members where indicated.
- .5 Use erection techniques and equipment that will not mark or abrade surfaces of exposed structural steel.
- .6 Touch-up galvanized surfaces with zinc rich primer where scratched or damaged during erection.
- 3.4 ADHESIVE ANCHORS** .1 Holes for adhesive concrete anchors must be drilled strictly as per manufacturer's instructions, at a minimum using one of the following methods:
- .1 Hammer-drilling in cracked and uncracked concrete
 - .2 Core-drilling with use of a specialty fluted rod in cracked and uncracked concrete.
 - .3 Core-drilling with continuously threaded rods, externally threaded inserts, and reinforcing bars in cracked and uncracked concrete, when the hole is subsequently roughened with a specialty approved roughening tool.
- 3.5 COPPER FITTINGS**
- .1 Install all copper pipe work in accordance with the project drawings.
- .2 New copper drainage fittings for drip pans . The Contractor shall be responsible for examination of existing and site measurement for new installation.
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3.6 CLEANING

- .3 New installation shall include all connectors, gaskets, hangers, and other appurtenances to drain drip pans to within 300mm of the floor at the nearest wall or column, whichever is closer.
- .3 Assemble piping using fittings manufactured to ANSI standards.
- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools, and equipment barriers.

END OF SECTION
